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ADVANCEMENT
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NOVUM ORGANUM

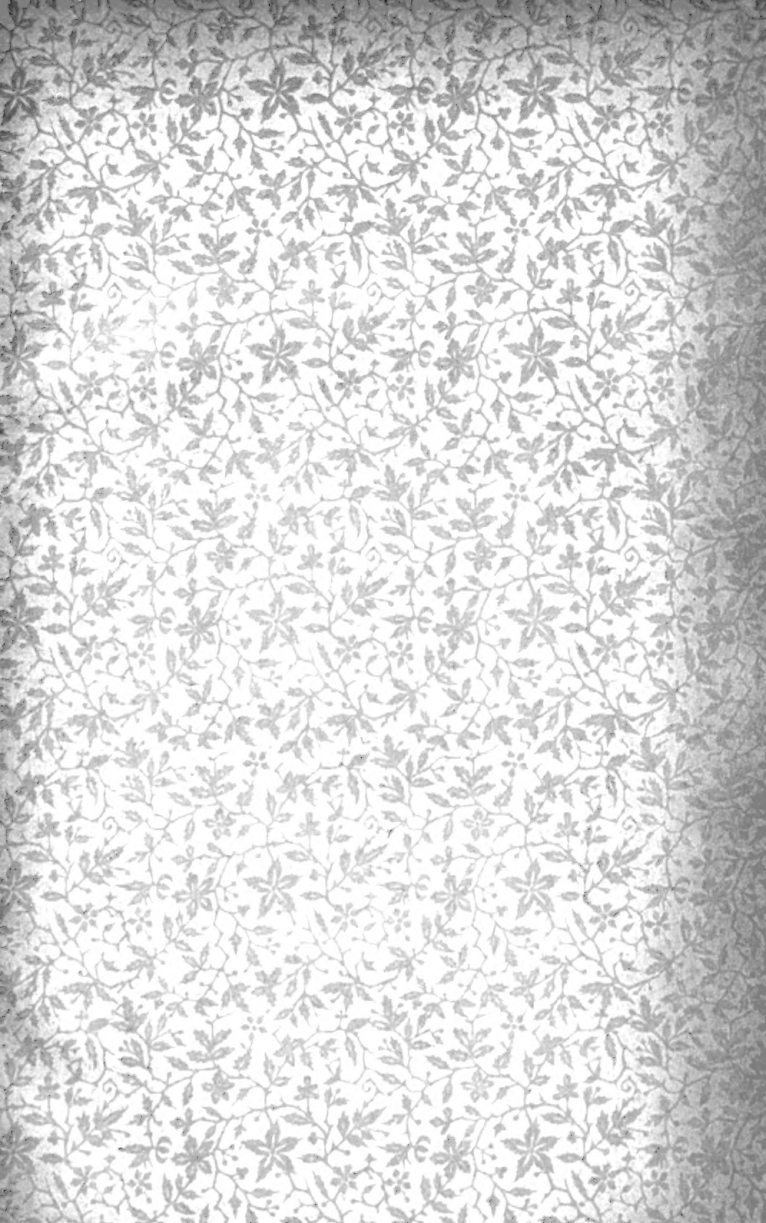
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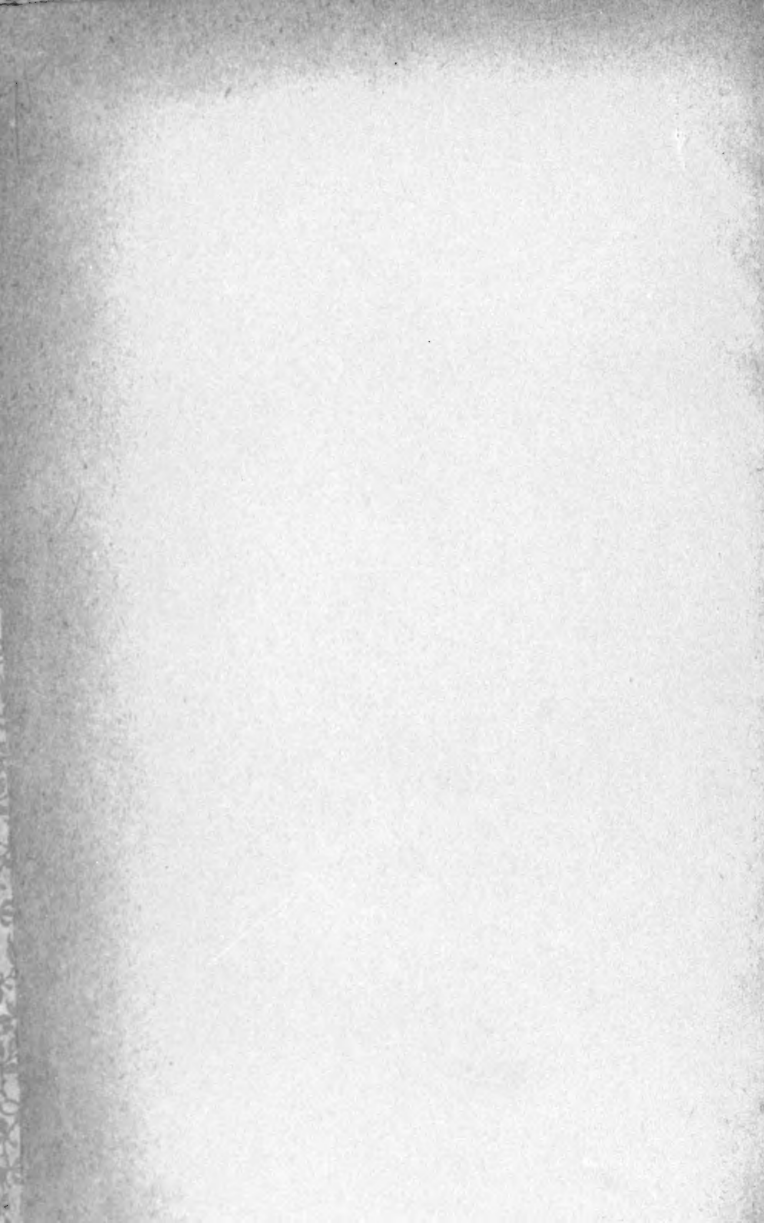


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FRANCIS BACON, VISCOUNT ST. ALBANS.

SEDI:

THE MINERVA LIBRARY OF FAMOUS BOOKS.

Edited by G. T. BETTANY, M.A., B.Sc.

ESSAYS CIVIL AND MORAL
ADVANCEMENT OF LEARNING,
NOVUM ORGANUM,
ETC. _o

BY
FRANCIS BACON

Viscount St. Albans, and sometime Lord Chancellor of England

WITH PORTRAIT AND BIOGRAPHICAL
INTRODUCTION

²⁾WARD, LOCK, BOWDEN,[#] AND CO.

¹⁾ LONDON,[#] NEW YORK, MELBOURNE, AND SYDNEY

³⁾ 1892
TORONTO, CAN.

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BIOGRAPHICAL INTRODUCTION.

FRANCIS BACON, statesman, lawyer, philosopher, and essayist, was the second son by his second wife of the Lord Keeper Sir Nicholas Bacon, and was born at York House, close to Charing Cross, on January 22, 1561. At the age of twelve years and three months he entered at Trinity College, Cambridge, but remained there less than two years. His father died in 1579, leaving him but a small fortune. He set to work at law, having already entered at Gray's Inn, and was admitted to the bar in 1582. In 1584 he became M.P. for Melcombe Regis, and he immediately took advantage of the ferment of public opinion about Mary Queen of Scots, to address a "Letter of Advice to Queen Elizabeth," which at once showed that he possessed a political genius far in advance of his time. He strongly advised toleration of the Catholics, whom he would only require to swear that they would bear arms against any foreign prince, or the pope, who should invade England. His next important step (in 1591) was to make the acquaintance of the Earl of Essex, who became warmly attached to him, while Bacon's friendship was scarcely disinterested, one of his objects being thus expressed by himself fourteen years later :—"I held at that time my lord to be the fittest instrument to do good to the State ; and therefore I applied myself to him in a manner which I think rarely happeneth among men." He gave him on all public matters the benefit of his statesmanlike advice, hoping that Essex would succeed in carrying it into effect. He himself took important action in the Parliament of 1593, in which he sat for the county of Middlesex, being successful in his

opposition to a joint conference of Lords and Commons on a question about subsidies, although his uncle, the Lord Treasurer Burghley, and the Court party were strongly in favour of the proposal. Queen Elizabeth was very angry with him, and seeing that his chances of official promotion were at present slender, he applied himself, with success, to work in the law courts. He might have become Solicitor-General at that time if he would have apologised to the queen for his conduct about the subsidy, but he would not be moved from his constitutional position. To make up for the disappointment—which to Essex, who had perseveringly urged his claims, was very deep—the latter gave Bacon a valuable piece of land. Bacon characteristically said that he accepted it with reservation of his duty to the Crown and to others. “I can be no more yours than I was.” In 1596, when Essex was at the highest point of success, and was being thought of as a man who might become dangerous even to the Crown, Bacon sent him a letter of advice, which, in addition to much that is excellent, recommends him “to use a variety of petty tricks, to make agreeable speeches, and to appear otherwise than he is” (Gardiner). At the same time he was preparing for publication the first edition of his “Essays,” issued early in 1597. A little later he was trying to persuade Essex to study the Irish question, then so prominent, but Essex’s quarrel with the queen intervened, and a peaceful settlement such as Bacon would have recommended became impossible. Late in 1598 Bacon encouraged Essex to take the command in Ireland, and told him that he might gain great glory by bringing the Irish under a just and civil government. Yet Bacon in his “Apology” says that he dissuaded Essex from going, as he would be risking the loss of the queen’s favour, and he would find the Irish difficult to conquer. Bacon may have forgotten himself, for the letter containing the advice to go is in existence, or he may have written two letters and sent only one. It is circumstances like these that support a charge of duplicity against Bacon. He was like many men of his time, willing to seek good political objects by finesse, by diplomacy, by calculating the chances as to which of two courses—which might or might not seem morally justifiable to us

—would best advance his ends. Thus, when, as one of her majesty's counsel, he had to plead against Essex in 1600, after his complete failure in Ireland, he treated him "not tenderly," as he admits, hoping thereby to retain the queen's goodwill, and afterwards use it in favour of Essex. Six weeks later Essex was liberated, but forbidden to come to Court. Bacon wrote to Essex, that though he loved few persons better than himself, yet he loved the queen's service and her favour, and the good of his country more. He appeared for the Crown at Essex's trial for treason in 1601, and largely helped to secure his conviction. Prof. Gardiner palliates his appearing thus against his former friend and benefactor by referring to the insecurity of the State and the necessity of preventing ambitious men from gaining undue authority, and then producing revolt and anarchy. But if Bacon's so-called "love" for Essex had had any real existence we cannot believe that he would have aided in bringing a death sentence on him. Even if all were the fault of Essex, others might have been allowed to point the arrow, wing it for flight, and take the deathly aim. In the last years of Elizabeth's reign Bacon busied himself in the advocacy of religious toleration in Ireland, and the establishment of courts of justice there without English technicalities. He also proposed the introduction, as a sort of garrison, of English settlers.

The accession of James led to Bacon's being knighted, and to his sending to the king plans for the union of England and Scotland, and for the pacification of the Church of England. Bacon was appointed one of the English Commissioners to discuss terms of union with the Scotch Commissioners. He laboured hard to secure freedom of commerce between the two countries, and the naturalisation of Scotchmen in England, and the converse. In 1605 he published his "Advancement of Learning." In 1606, in spite of his warm advocacy, the House of Commons rejected his statesmanlike proposals about the union: he was more than a century in advance of his time. Disappointed in his hopes of gaining more influence at Court, Bacon employed his leisure in his philosophical works, and in 1610 he had finished the "Wisdom of the Ancients," also having made

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progress with his "Instauratio Magna." On Lord Salisbury's death Bacon was urgent with the king to make use of his political services, suggesting plans and measures of great importance. Adroit manipulation figures too largely in them; but his advice to the king to have no more bargaining with his subjects, to wait patiently till the Commons were willing to grant supplies, that "Charity seeketh not her own," and that the king was to take care of his subjects and his subjects take care of their king, was too high-pitched for that age. Bacon was surprised by the news of the secret arrangement of the Spanish marriage, but he still adhered to the king, and took his side against Coke in the long quarrel about the supremacy of the judges over the king's orders, which we cannot detail here. Coke was dismissed from the Chief Justiceship in 1616. Bacon became a privy councillor; and in March, 1617, he reached one of the goals of his ambition in being appointed Lord Keeper. In 1618 his title was changed to Lord Chancellor, and he was created Baron Verulam. As a judge he was rapid and just; but Buckingham continually sent him letters, asking him to favour his friends in their suits. He managed adroitly to steer clear of any open yielding. Against Buckingham's desires he advocated the abolition of the more injurious patents and monopolies then so numerous and so fettering to trade and invention. In 1620 he published his "Novum Organum"; and in 1621 he kept his sixtieth birthday at York House, which Ben Jonson celebrated in verse, depicting him as one

"Whose even thread the fates spin round and full
Out of their choicest and their whitest wool."

A few days later he was created Viscount St. Albans.

But a storm was brewing which he could not weather with all his manipulation. In March, Cranfield, the Master of the Wards, accused the Court of Chancery of unduly protecting insolvents; but very quickly certain petitions were presented to the House of Commons in which the Lord Chancellor was directly accused of bribery: he had taken money from persons and decided their cases *against* them. He had himself laid down as a rule, that,

though it was then customary for judges to take presents from suitors, they should never be accepted while the cause was pending. The charges against him were sent to the House of Lords for investigation, but Bacon's health broke down, and he was not able to defend himself. When he saw the charges in detail, he acknowledged that he had come under condemnation by taking money while cases were pending, though he had never taken a bribe from corrupt motives. He made a confession and submission to the Lords, hoping for lenient treatment. But he was dismissed from the Chancellorship, fined £40,000, ordered to be imprisoned during the king's pleasure, and excluded from Parliament and the Court. The king released him after a few days, assigned his fine to trustees for his use, and gave him a qualified pardon.

Bacon, conscious of having judged impartially and independently of suitors' presents, was not so cast down but that he was able to turn immediately to his literary and scientific pursuits. By October in the year of his fall he had finished his "History of Henry VII. "; next he translated into Latin his "Advancement of Learning." He offered to draw up a digest of English law, and still sought for public employment. In 1625 he in vain applied for a full pardon, so that he could once more sit in parliament. He continued to work at his "*Instauratio Magna*," but ill-health now made his work difficult. He took a chill in getting some snow to insert in a fowl in order to observe its effect in preserving the flesh, and died at Lord Arundel's on April 9, 1626, of bronchitis. He was buried at St. Michael's Church, St. Albans.

Bacon's Essays, whatever we may think of the opinions they express, are certainly models of condensed expressive style. One may say, as a general rule, that everything is said well, so as to convey the author's meaning, in the fewest and most appropriate words. Even Shakespeare does not afford a larger proportion of generally known quotations than these Essays.

As to the matter of many of the Essays opinion differs widely. For instance, in saying that "the stage is more beholding to love than the life of man," the author contradicts human experience.

feeling, and aspiration. So also Bacon was not in advance of his times in his attitude towards heretics. In his views on the divine right and even divinity of kings, Bacon outdoes almost every one. "A king is a mortal god on earth," he begins; and concludes, "He then that honoureth him not is next an atheist, wanting the fear of God in his heart."

Each reader for himself must appropriate the value of these Essays. Their excellences need no pointing out. Those who think to read a dozen at a sitting will find it quite sufficient exercise of their thoughts to consider only one or two.

No translations of the frequent Latin quotations are here given; in most cases the essence of them is given in the sentence preceding or following them.

The "Advancement of Learning" stands in the front rank among books of suggestion, books which stimulate thought, books which educate. The masterly defence of true learning and of its advancement and propagation in Book I. destroyed many ill-founded objections. How happy a thing it would be for many men of science if they could, as Bacon recommends, give up making mere knowledge the be-all and end-all of life! How fortunate we should all be if we could use our knowledge to give ourselves repose and contentment and not distaste or repining! But Bacon sets no limits to our search into God's works, and he recommends every one to take up some study; all men, he says, have leisure for some learning. In pointing out abuses of learning, Bacon discusses things still applicable. We have not yet lost sight of vain and contentious learning, the multiplication of new and difficult terms, the bowing down to certain authors as dictators.

Bacon's panegyric on the dignity of knowledge is scarcely improved by his reference to Adam's learning in the garden of Eden, or his running catalogue of celebrated men or potentates who acquired or favoured learning.

The Second Book grapples with the main question—How learning is to be advanced. The foundation of colleges, endowment of professors' chairs, which ought to be well paid, the endowment of research which cannot be adequately carried on by

private means, are among measures advocated by Bacon, and progressing ever since his time. The chief part of the book is taken up by a survey of all subjects of knowledge, noting especially those which are incompletely investigated. It is very interesting to see how many of the subjects mentioned have since Bacon's time been undertaken and thoroughly dealt with. But his description of and reference to poetry, of which he considers we have quite enough, will by no means be endorsed by those who have any feeling for the divine art.

In the "*Novum Organum*" Bacon commences with a long series of aphorisms, in which he points out the sources of error in the past, and especially certain general causes which make against the attainment of truth. His celebrated "idols" (*εἰδωλα*), or phantoms of the mind, include the idols—one might say the prejudices—of the human race, those of the individual, whether by nature or education, those of the market-place or public speech, in which names are given to unreal things, or words wrongly represent real things. The "idols" of the theatre, following one another like scenes in a play, are successive false systems of philosophy or demonstration. Book II. contains Bacon's celebrated method for the discovery of truth by experiment and induction. His method is complex, probably more complex than it would have been if he had been a great experimentalist; but its special merit is that of showing how to eliminate the non-essential, and, by means of crucial experiments, trace an effect to its cause. He endeavoured to illustrate his method by a supposed investigation into heat, and showed his prescience by giving a definition of heat which marvellously resembles the modern theory. In some points this investigation shows Bacon's ignorance of what was already known; and it is strange to find no mention of Harvey's discoveries as to the circulation of the blood. His ignorance of the Copernican theory and of other astronomical discoveries, and his contempt for Dr. Gilbert's invaluable work on magnetism, are phenomena which we can only put down to his large occupation in political work and to the overpowering necessity that he felt of putting forth what was in himself. But his ignorance of many things may well be forgiven, when we remember the

great number of brilliant suggestions which he himself put forward.

“Bacon called men as with the voice of a herald to lay themselves alongside of nature, to study her ways, and imitate her processes. . . . He insisted, both by example and precept, on the importance of experiment as well as observation. Nature, like a witness, when put to the torture, would reveal her secrets. In both these ways Bacon recalled men to the study of facts, and though, in the first instance, he had mainly in view the facts of external nature, the influence of his teaching soon extended itself, as he undoubtedly purposed that it should do, to the facts of mind, conduct, and society. In order to set men free to study facts, it was necessary to deliver them from the pernicious subjection to authority, to which they had so long been enslaved. Hardly less important . . . was the emancipation of reason from the bewitching enchantments of imagination. . . . Bacon insisted on the necessity of a logic of induction . . . and to this logic of induction he himself made no contemptible contributions. That our instances require to be selected and not merely accumulated, . . . he was never weary of repeating” (Prof. Fowler in “Dictionary of National Biography”).

Bacon's works rank among the choicest English classics. For literary style, for thought, for scientific value they are priceless. “For my name and memory,” wrote Bacon in his will in 1625, “I leave it to men's charitable speeches, and to foreign nations, and the next ages.” His hopes are fulfilled; charity views his conduct with leniency; all nations have benefited by his teachings, which will be valued as long as the English language endures.

G. T. B.

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TO MR. ANTHONY BACON,

HIS DEAR BROTHER.

LOVING and beloved brother, I do now like some that have an orchard ill neighboured, that gather their fruit before it is ripe, to prevent stealing. These fragments of my conceit were going to print : to labour the stay of them had been troublesome, and subject to interpretation ; to let them pass had been to adventure the wrong they might receive by untrue copies, or by some garnishment which it might please any that should set them forth to bestow upon them ; therefore I held it best discretion to publish them myself, as they passed long ago from my pen, without any further disgrace than the weakness of the author ; and as I did ever hold, there might be as great a vanity in retiring and withdrawing men's conceit (except they be of some nature) from the world, as in obtruding them : so in these particulars I have played myself the inquisitor, and finding nothing to my understanding in them contrary or infectious to the state of religion or manners, but rather, as I suppose, medicinable : only I dislike now to put them out, because they will be like the late new half-pence, which though the silver were good, yet the pieces were small ; but since they would not stay with their master, but would needs travel abroad, I have preferred them to you that are next myself ; dedicating them, such as they are, to our love, in the depth whereof, I assure you, I sometimes wish your infirmities translated upon myself, that her majesty might have the service of so active and able a mind ; and I might be with excuse confined to these contemplations and studies, for which I am fittest ; so commend I you to the preservation of the Divine Majesty.

Your entire loving brother,

FRANCIS BACON.

*From my Chamber at Gray's Inn,
this 30th of January, 1597.*

TO MY LOVING BROTHER,
SIR JOHN CONSTABLE, KT.

My last Essays I dedicated to my dear brother, Mr. Anthony Bacon, who is with God. Looking among my papers this vacation, I found others of the same nature : which if I myself shall not suffer to be lost, it seemeth the world will not, by the often printing of the former. Missing my brother, I found you next ; in respect of bond, both of near alliance, and of straight friendship and society, and particularly of communication in studies ; wherein I must acknowledge myself beholden to you : for as my business found rest in my contemplations, so my contemplations ever found rest in your loving conference and judgment : so wishing you all good, I remain

Your loving brother and friend,

1612.

FRANCIS BACON.

TO THE
RIGHT HONOURABLE MY VERY GOOD LORD
THE DUKE OF BUCKINGHAM,
His Grace Lord High Admiral of England.

EXCELLENT LORD,

SOLOMON says, "a good name is as a precious ointment;" and I assure myself such will your Grace's name be with posterity : for your fortune and merit both have been eminent ; and you have planted things that are like to last. I do now publish my Essays ; which of all my other works, have been most current ; for that, as it seems, they come home to men's business and bosoms. I have enlarged them both in number and weight ; so that they are indeed a new work : I thought it, therefore, agreeable to my affection and obligation to your Grace, to prefix your name before them, both in English and Latin : for I do conceive, that the Latin volume of them, being in the universal language, may last as long as books last. My Instauration I dedicated to the King ; my History of Henry the Seventh, which I have now translated into Latin, and my portions of Natural History, to the Prince ; and these I dedicate to your Grace, being of the best fruits, that, by the good increase which God gives to my pen and labours, I could yield. God lead your Grace by the hand.

Your Grace's most obliged and faithful servant,

FRANCIS ST. ALBAN.

ESSAYS CIVIL AND MORAL.

I. OF TRUTH.

WHAT is truth? said jesting Pilate; and would not stay for an answer. Certainly there be that delight in giddiness; and count it a bondage to fix a belief; affecting free-will in thinking, as well as in acting. And though the sect of philosophers of that kind be gone, yet there remain certain discoursing wits, which are of the same veins, though there be not so much blood in them as was in those of the ancients. But it is not only the difficulty and labour which men take in finding out of truth; nor again, that when it is found, it imposeth upon men's thoughts; that doth bring lyes in favour: but a natural though corrupt love of the lye itself. One of the later school of the Grecians examineth the matter, and is at a stand to think what should be in it, that men should love lyes; where neither they make for pleasure, as with poets; nor for advantage, as with the merchant; but for the lye's sake. But I cannot tell: this same truth is a naked and open day-light, that doth not show the masks, and mummeries, and triumphs of the world, half so stately and daintily as candle-lights. Truth may perhaps come to the price of a pearl, that showeth best by day; but it will not rise to the price of a diamond or carbuncle, that showeth best in varied lights. A mixture of a lye doth ever add pleasure. Doth any man doubt, that if there were taken out of men's minds, vain opinions, flattering hopes, false valuations, imaginations as one would, and the like; but it would leave the minds of a number of men, poor shrunken things; full of melancholy and indisposition, and unpleasing to themselves? One of the fathers, in great severity, called poesy, *vinum dæmonum*; because it filleth the imagination, and yet it is but with the shadow of a lye. But it is not the lye that passeth through the mind, but the lye that sinketh in, and settleth in it, that doth the hurt, such as we spake of before. But howsoever these things are thus in men's depraved judgments and affections, yet truth, which only doth judge itself, teacheth, that the inquiry of truth, which is the love-making, or wooing of it; the knowledge of truth, which is the presence of it; and the belief of truth, which is the enjoying of it; is the sovereign good of human nature. The first creature of God, in the works of the days, was the light of the sense; the last was the light of reason; and his sabbath work ever since is the illumination of his Spirit. First he breathed light upon the face of the matter, or chaos; then he breathed light into the face of man; and still he breatheth and inspireth light into the face of his chosen. The poet that beautified the sect, that was otherwise inferior to the rest, saith yet excellently well: "It is a pleasure to stand upon the shore, and to see

ships tost upon the sea : a pleasure to stand in the window of a castle, and to see a battle, and the adventures thereof below : but no pleasure is comparable to the standing upon the vantage ground of truth, a hill not to be commanded, and where the air is always clear and serene : and to see the errors, and wanderings, and mists, and tempests, in the vale below :” so always, that this prospect be with pity, and not with swelling or pride. Certainly, it is heaven upon earth to have a man’s mind move in charity, rest in providence, and turn upon the poles of truth.

To pass from theological and philosophical truth, to the truth of civil business ; it will be acknowledged, even by those that practise it not, that clear and round dealing is the honour of man’s nature ; and that mixture of falsehood is like allay in coin of gold and silver : which may make the metal work the better, but it embaseth it. For these winding and crooked courses are the goings of the serpent ; which goeth basely upon the belly, and not upon the feet. There is no vice that doth so cover a man with shame, as to be found false and perfidious. And therefore Montagne saith prettily, when he inquired the reason, why the word of the lye should be such a disgrace, and such an odious charge ? Saith he, “ If it be well weighed, to say that a man lyeth, is as much as to say, that he is brave towards God, and a coward towards men. For a lye faces God, and shrinks from man.” Surely the wickedness of falsehood, and breach of faith, cannot possibly be so highly expressed, as in that it shall be the last peal to call the judgments of God upon the generations of men : it being foretold, that when Christ cometh “ he shall not find faith upon the earth.”

II. OF DEATH.

Men fear death, as children fear to go in the dark : and as that natural fear in children is increased with tales, so is the other. Certainly, the contemplation of death, as the wages of sin, and passage to another world, is holy and religious ; but the fear of it, as a tribute due unto nature, is weak. Yet in religious meditations, there is sometimes mixture of vanity and of superstition. You shall read in some of the friars’ books of mortification, that a man should think with himself, what the pain is, if he have but his finger’s end pressed or tortured ; and thereby imagine what the pains of death are, when the whole body is corrupted and dissolved ; when many times death passeth with less pain than the torture of a limb : for the most vital parts are not the quickest of sense. And by him that spake only as a philosopher, and natural man, it was well said, “ *Pompa mortis magis terret, quam mors ipsa.*” Groans and convulsions, and a discoloured face, and friends weeping, and blacks, and obsequies, and the like, show death terrible. It is worthy the observing, that there is no passion in the mind of man so weak, but it mates and masters the fear of death : and therefore death is no such terrible enemy, when a man hath so many attendants about him, that can win the combat of him. Revenge triumphs over death ; love slights it ; honour aspireth to it ;

grief flieth to it ; fear pre-occupateth it : nay, we read, after Otho the emperor had slain himself, pity, which is the tenderest of affections, provoked many to die, out of mere compassion to their sovereign, and as the truest sort of followers. Nay, Seneca adds, niceness and satiety ; “*cogita quamdiu eadem feceris ; mori velle, non tantum fortis, aut miser, sed etiam fastidiosus potest.*” A man would die, though he were neither valiant, nor miserable, only upon a weariness to do the same thing so oft over and over. It is no less worthy to observe, how little alteration in good spirits the approaches of death make ; for they appear to be the same men till the last instant. Augustus Caesar died in a compliment ; “*Livia, conjugii nostri, memor vive, et vale.*” Tiberius in dissimulation ; as Tacitus saith of him ; “*Jam Tiberium vires et corpus, non dissimulatio, deserebant.*” Vespasian in a jest ; sitting upon the stool ; “*Ut puto, Deus fio.*” Galba with a sentence ; “*Feri, si ex re sit populi Romani ;*” holding forth his neck. Septimius Severus in despatch ; “*Adeste, si quid mihi restat agendum :*” and the like. Certainly the Stoics bestowed too much cost upon death, and by their great preparations made it appear more fearful. Better saith he, “*qui finem vite extremum inter munera ponit nature.*” It is as natural to die, as to be born ; and to a little infant, perhaps, the one is as painful as the other. He that dies in an earnest pursuit, is like one that is wounded in hot blood ; who, for the time, scarce feels the hurt ; and therefore a mind fixt and bent upon somewhat that is good, doth avert the dolours of death : but above all, believe it, the sweetest canticle is “*Nunc dimittis ;*” when a man hath obtained worthy ends and expectations. Death hath this also ; that it openeth the gate to good fame, and extinguisheth envy.—“*Extinctus amabitur idem.*”

III. OF UNITY IN RELIGION.

Religion being the chief band of human society, it is a happy thing, when itself is well contained within the true band of unity. The quarrels and divisions about religion were evils unknown to the heathen. The reason was, because the religion of the heathen consisted rather in rites and ceremonies, than in any constant belief. For you may imagine what kind of faith theirs was, when the chief doctors and fathers of their church were the poets. But the true God hath this attribute, that he is a jealous God ; and therefore his worship and religion will endure no mixture nor partner. We shall therefore speak a few words concerning the unity of the Church : what are the fruits thereof ; what are the bounds ; and what the means.

The fruits of unity, next unto the well-pleasing of God, which is all in all, are two ; the one towards those that are without the Church ; the other towards those that are within. For the former : it is certain that heresies and schisms are of all others the greatest scandals ; yea more than corruption of manners. For as in the natural body, a wound, or solution of continuity, is worse than a corrupt humour ; so in the spiritual. So that nothing doth so much keep men out of the

Church, and drive men out of the Church, as breach of unity: and therefore, whensoever it cometh to that pass, that one saith, "ecce in deserto;" another saith, "ecce in penetralibus;" that is, when some men seek Christ in the conventicles of heretics, and others in an outward face of a church, that voice had need continually to sound in men's ears, "nolite exire," go not out. The doctor of the Gentiles, the propriety of whose vocation drew him to have a special care of those without, saith: "If an heathen come in, and hear you speak with several tongues, will he not say that you are mad?" And certainly it is little better when atheists and profane persons do hear of so many discordant and contrary opinions in religion; it doth avert them from the Church, and maketh them "to sit down in the chair of the scorers." It is but a light thing to be vouched in so serious a manner, but yet it expresseth well the deformity: there is a master of scoffing, that in his catalogue of books of a feigned library sets down this title of a book, "The Morris-dance of Heretiques." For indeed every sect of them hath a diverse posture or cringe by themselves, which cannot but move derision in worldlings and depraved politics, who are apt to contemn holy things.

As for the fruit towards those that are within, it is peace; which containeth infinite blessings: it establisheth faith; it kindleth charity; the outward peace of the Church distilleth into peace of conscience; and it turneth the labours of writing and reading of controversies into treatises of mortification and devotion.

Concerning the bonds of unity; the true placing of them importeth exceedingly. There appear to be two extremes. For to certain zealots all speech of pacification is odious. "Is it peace, Jehu? What hast thou to do with peace? turn thee behind me." Peace is not the matter, but following and party. Contrariwise, certain Laodiceans, and lukewarm persons, think they may accommodate points of religion by middle-ways, and taking part of both, and witty reconcilements; as if they would make an arbitrement between God and man. Both these extremes are to be avoided; which will be done, if the league of Christians, penned by our Saviour himself, were, in the two cross clauses thereof, soundly and plainly expounded: "he that is not with us is against us:" and again, "he that is not against us is with us:" that is, if the points fundamental, and of substance, in religion, were truly discerned and distinguished from points not merely of faith, but of opinion, order, or good intention. This is a thing may seem to many a matter trivial, and done already; but if it were done less partially, it would be embraced more generally.

Of this I may give only this advice, according to my small model. Men ought to take heed of rending God's Church by two kinds of controversies. The one is, when the matter of the point controverted is too small and light, not worth the heat and strife about it, kindled only by contradiction. For, as it is noted by one of the Fathers, Christ's coat indeed had no seam; but the Church's vesture was of divers colours: whereupon he saith, "in veste varietas sit, scissura non sit;" they be two things, unity, and uniformity. The other is,

when the matter of the point controverted is great; but it is driven to an over-great subtilty and obscurity; so that it becometh a thing rather ingenious than substantial. A man that is of judgment and understanding shall sometimes hear ignorant men differ, and know well within himself that those which so differ mean one thing, and yet they themselves would never agree. And if it come so to pass in that distance of judgment which is between man and man, shall we not think that God above, that knows the heart, doth not discern that frail men, in some of their contradictions, intend the same thing, and accepteth of both? The nature of such controversies is excellently expressed by St. Paul, in the warning and precept that he giveth concerning the same: "*devita profanas vocum novitates, et oppositiones falsi nominis scientiæ.*" Men create oppositions which are not; and put them into new terms so fixed, as, whereas the meaning ought to govern the term, the term in effect governeth the meaning. There be also two false peaces or unities: the one, when the peace is grounded but upon an implicit ignorance; for all colours will agree in the dark: the other, when it is pieced up upon a direct admission of contraries in fundamental points. For truth and falsehood, in such things, are like the iron and clay in the toes of Nebuchadnezzar's image; they may cleave, but they will not incorporate.

Concerning the means of procuring unity: men must beware, that in the procuring or muniting of religious unity, they do not dissolve and deface the laws of charity, and of human society. There be two swords amongst Christians, the spiritual and temporal; and both have their due office and place in the maintenance of religion. But we may not take up the third sword, which is Mahomet's sword, or like unto it; that is, to propagate religion by wars, or by sanguinary persecutions to force consciences; except it be in cases of overt scandal, blasphemy, or intermixture of practice against the state; much less to nourish seditions; to authorize conspiracies and rebellions; to put the sword into the people's hands, and the like, tending to the subversion of all government, which is the ordinance of God. For this is but to dash the first table against the second; and so to consider men as Christians, as we forget that they are men. Lucretius the poet, when he beheld the act of Agamemnon, that could endure the sacrificing of his own daughter, exclaimed:

Tantum religio potuit suadere malorum.

What would he have said, if he had known of the massacre in France, or the powder-treason of England? He would have been seven times more epicure and atheist than he was: for as the temporal sword is to be drawn with great circumspection, in cases of religion; so it is a thing monstrous to put into the hands of the common people. Let that be left unto the anabaptists and other furies. It was great blasphemy, when the devil said, "I will ascend, and be like the Highest;" but it is greater blasphemy to personate God, and bring him in saying, "I will descend, and be like the prince of darkness." And what is it better to make the cause of religion to descend to the cruel and

execrable actions of murdering princes, butchery of people, and subversion of states and governments? Surely, this is to bring down the Holy Ghost, instead of the likeness of a dove, in the shape of a vulture or raven: and to set, out of the bark of a Christian Church, a flag of a bark of pirates and assassins. Therefore it is most necessary, that the Church by doctrine and decree; princes by their sword; and all learnings, both Christian and moral, as by their mercury rod: do damn and send to hell for ever those facts and opinions, tending to the support of the same; as hath been already in good part done. Surely in counsels concerning religion, that counsel of the apostle would be prefixed; "*Ira hominis non implet justitiam Dei.*" And it was a notable observation of a wise father, and no less ingeniously confessed; That those which held and persuaded pressure of consciences, were commonly interested therein themselves for their own ends

IV. OF REVENGE.

Revenge is a kind of wild justice, which the more a man's nature runs to, the more ought law to weed it out. For as for the first wrong, it doth but offend the law; but the revenge of that wrong putteth the law out of office. Certainly in taking revenge, a man is but even with his enemy; but in passing it over, he is superior: for it is a prince's part to pardon. And Solomon, I am sure, saith, "It is the glory of a man to pass by an offence." That which is past is gone and irrevocable, and wise men have enough to do with things present and to come: therefore they do but trifle with themselves that labour in past matters. There is no man doth a wrong for the wrong's sake; but thereby to purchase himself profit, or pleasure, or honour, or the like. Therefore why should I be angry with a man for loving himself better than me? And if any man should do wrong, merely out of ill-nature, why, yet it is but like the thorn or brier, which prick or scratch, because they can do no other. The most tolerable sort of revenge is for those wrongs which there is no law to remedy: but then let a man take heed the revenge be such as there is no law to punish; else a man's enemy is still beforehand, and it is two for one. Some, when they take revenge, are desirous the party should know whence it cometh: this is the more generous. For the delight seemeth to be not so much in doing the hurt, as in making the party repent: but base and crafty cowards are like the arrow that flieth in the dark. Cosmus, duke of Florence, had a desperate saying against perfidious or neglecting friends, as if those wrongs were unpardonable. "You shall read," saith he, "that we are commanded to forgive our enemies; but you never read, that we are commanded to forgive our friends." But yet the spirit of Job was in a better tune; "Shall we," saith he, "take good at God's hands, and not be content to take evil also?" And so of friends in a proportion. This is certain, that a man that studieth revenge, keeps his own wounds green, which otherwise would heal and do well. Public revenges are for the most part fortunate: as that for the death of Cæsar; for the death of Pertinax; for the death

of Henry the Third of France ; and many more : but in private revenges it is not so ; nay, rather, vindicative persons live the life of witches ; who as they are mischievous, so end they unfortunate.

V. OF ADVERSITY.

It was a high speech of Seneca, after the manner of the Stoics, that the good things which belong to prosperity are to be wished, but the good things that belong to adversity are to be admired : “ *Bona rerum secundarum optabilia, adversarum mirabilia.*” Certainly if miracles be the command over nature, they appear most in adversity. It is yet a higher speech of his than the other, much too high for a heathen, It is true greatness to have in one the frailty of a man, and the security of a God : “ *Vere magnum, habere fragilitatem hominis, securitatem Dei.*” This would have done better in poesy, where transcendencies are more allowed. And the poets indeed have been busy with it ; for it is in effect the thing which is figured in that strange fiction of the ancient poets, which seemeth not to be without mystery ; nay, and to have some approach to the state of a Christian : that Hercules, when he went to unbind Prometheus, by whom human nature is represented, sailed the length of the great ocean in an earthen pot or pitcher ; lively describing Christian resolution, that saileth in the frail bark of the flesh through the waves of the world. But to speak in a mean : the virtue of prosperity is temperance ; the virtue of adversity is fortitude ; which in morals is the more heroical virtue. Prosperity is the blessing of the Old Testament ; adversity is the blessing of the New, which carrieth the greater benediction, and the clearer revelation of God’s favour. Yet, even in the Old Testament, if you listen to David’s harp, you shall hear as many hearse-like airs as carols : and the pencil of the Holy Ghost hath laboured more in describing the afflictions of Job than the felicities of Solomon. Prosperity is not without many fears and distates ; and adversity is not without comforts and hopes. We see in needle-works and embroideries, it is more pleasing to have a lively work upon a sad and solemn ground, than to have a dark and melancholy work upon a lightsome ground : judge therefore of the pleasure of the heart by the pleasure of the eye. Certainly virtue is like precious odours, most fragrant when they are incensed or crushed ; for prosperity doth best discover vice, but adversity doth best discover virtue.

VI. OF SIMULATION AND DISSIMULATION.

Dissimulation is but a faint kind of policy, or wisdom ; for it asketh a strong wit, and a strong heart, to know when to tell truth and to do it. Therefore it is the weaker sort of politicians that are the great dissemblers.

Tacitus saith, Livia sorted well with the arts of her husband, and dissimulation of her son ; attributing arts or policy to Augustus, and dissimulation to Tiberius. And again, when Mucianus encourageth Vespasian to take arms against Vitellius, he saith ; We rise not

against the piercing judgment of Augustus, nor the extreme caution or closeness of Tiberius. These properties of arts or policy, and dissimulation or closeness, are indeed habits and faculties several, and to be distinguished. For if a man have that penetration of judgment as he can discern what things are to be laid open, and what to be secreted, and what to be showed at half-lights, and to whom and when, which indeed are arts of state, and arts of life, as Tacitus well calleth them, to him a habit of dissimulation is a hinderance and a poorness. But if a man cannot obtain to that judgment, then it is left to him, generally, to be close and a dissembler. For where a man cannot choose, or vary in particulars, there it is good to take the safest and wariest way in general ; like the going softly by one that cannot well see. Certainly the ablest men that ever were, have had all an openness and frankness of dealing, and a name of certainty and veracity ; but then they were like horses well managed ; for they could tell passing well when to stop or turn : and at such times, when they thought the case indeed required dissimulation, if then they used it, it came to pass, that the former opinion spread abroad of their good faith and clearness of dealing made them almost invisible.

There be three degrees of this hiding and veiling of a man's self. The first, closeness, reservation, and secrecy, when a man leaveth himself without observation, or without hold to be taken, what he is. The second, dissimulation in the negative, when a man lets fall signs and arguments, that he is not that he is. And a third, simulation in the affirmative, when a man industriously and expressly feigns and pretends to be that he is not.

For the first of these, secrecy ; it is indeed the virtue of a confessor ; and assuredly the secret man heareth many confessions ; for who will open himself to a blab or a babbler ? but if a man be thought secret, it inviteth discovery ; as the more close air sucketh in the more open : and as in confession the revealing is not for worldly use, but for the ease of a man's heart ; so secret men come to knowledge of many things in that kind ; while men rather discharge their minds, than impart their minds. In a few words, mysteries are due to secrecy. Besides, to say truth, nakedness is uncomely as well in mind as body ; and it addeth no small reverence to men's manners and actions if they be not altogether open. As for talkers and futile persons, they are commonly vain and credulous withal. For he that talketh what he knoweth, will also talk what he knoweth not. Therefore set it down, that a habit of secrecy is both politic and moral. And in this part it is good that a man's face give his tongue leave to speak. For the discovery of a man's self by the tracts of his countenance is a great weakness and betraying ; by how much it is many times more marked and believed than man's words.

For the second, which is dissimulation ; it followeth many times upon secrecy, by necessity : so that he that will be secret must be a dissembler in some degree. For men are too cunning to suffer a man to keep an indifferent carriage between both, and to be secret, without swaying the balance on either side. They will so beset a man with

questions, and draw him on, and pick it out of him, that, without an absurd silence, he must show an inclination one way ; or if he do not, they will gather as much by his silence as by his speech. As for equivocations, or oraculous speeches, they cannot hold out long. So that no man can be secret, except he give himself a little scope of dissimulation, which is as it were but the skirts or train of secrecy.

But for the third degree, which is simulation and false profession ; that I hold more culpable and less politic, except it be in great and rare matters. And therefore a general custom of simulation, which is this last degree, is a vice rising either of a natural falseness, or fearfulness, or of a mind that hath some main faults ; which because a man must needs disguise, it maketh him practise simulation in other things, lest his hand should be out of use.

The great advantages of simulation and dissimulation are three. First, to lay asleep opposition, and to surprise. For where a man's intentions are published, it is an alarm to call up all that are against them. The second is, to reserve a man's self a fair retreat : for if a man engage himself by a manifest declaration, he must go through, or take a fall. The third is, the better to discover the mind of another. For to him that opens himself, men will hardly show themselves adverse : but will fair let him go on, and turn their freedom of speech to freedom of thought. And therefore it is a good shrewd proverb of the Spaniard, Tell a lie, and find a truth. As if there were no way of discovery but by simulation. There be also three disadvantages to set it even. The first, that simulation and dissimulation commonly carry with them a show of fearfulness, which in any business doth spoil the feathers of round flying up to the mark. The second, that it puzzleth and perplexeth the conceits of many, that perhaps would otherwise co-operate with him ; and makes a man walk almost alone, to his own ends. The third and greatest is, that it depriveth a man of one of the most principal instruments for action ; which is trust and belief. The best composition and temperature is, to have openness in fame and opinion ; secrecy in habit ; dissimulation in seasonable use ; and a power to feign, if there be no remedy.

VII. OF PARENTS AND CHILDREN.

The joys of parents are secret ; and so are their griefs and fears. they cannot utter the one, nor they will not utter the other. Children sweeten labours ; but they make misfortunes more bitter ; they increase the cares of life, but they mitigate the remembrance of death. The perpetuity by generation is common to beasts ; but memory, merit, and noble works, are proper to men : and surely a man shall see the noblest works and foundations have proceeded from childless men ; which have sought to express the images of their minds, where those of their bodies have failed : so the care of posterity is most in them that have no posterity. They that are the first raisers of their houses, are most indulgent towards their children ; beholding them as the continuance, not only of their kind, but of their work ; and so both children and creatures.

The difference in affection of parents towards their several children is many times unequal ; and sometimes unworthy ; especially in the mother ; as Solomon saith, "A wise son rejoiceth the father, but an ungracious son shames the mother." A man shall see, where there is a house full of children, one or two of the eldest respected, and the youngest made wantons ; but in the midst, some that are as it were forgotten, who many times nevertheless prove the best. The illiberality of parents in allowance towards their children, is an harmful error ; makes them base ; acquaints them with shifts ; makes them sort with mean company ; and makes them surfeit more when they come to plenty : and therefore the proof is best when men keep their authority towards their children, but not their purse. Men have a foolish manner, both parents, and schoolmasters, and servants, in creating and breeding an emulation between brothers, during childhood, which many times sorteth to discord when they are men, and disturbeth families. The Italians make little difference between children and nephews, or near kinsfolks ; but so they be of the lump they care not, though they pass not through their own body. And, to say truth, in nature it is much a like matter ; insomuch that we see a nephew some times resembleth an uncle, or a kinsman, more than his own parent ; as the blood happens. Let parents choose betimes the vocations and courses they mean their children should take : for then they are most flexible ; and let them not too much apply themselves to the disposition of their children, as thinking they will take best to that which they have most mind to. It is true, that if the affection or aptness of the children be extraordinary, then it is good not to cross it : but generally the precept is good, "*Optimum elige, suave et facile iudicet consuetudo.*" Younger brothers are commonly fortunate, but seldom or never where the elder are disinherited.

VIII. OF MARRIAGE AND SINGLE LIFE.

He that hath wife and children, hath given hostages to fortune ; for they are impediments to great enterprises, either of virtue or mischief. Certainly the best works and of greatest merit for the public, have proceeded from the unmarried or childless men : which both in affection and means have married and endowed the public. Yet it were great reason, that those that have children should have greatest care of future times : unto which they know they must transmit their dearest pledges. Some there are, who though they lead a single life, yet their thoughts do end with themselves, and account future times importunities. Nay, there are some other, that account wife and children but as bills of charges. Nay more, there are some foolish rich covetous men, that take a pride in having no children because they may be thought so much the richer. For perhaps they have heard some talk, Such a one is a great rich man ; and another except to it, Yea, but he hath a great charge of children : as if it were an abatement to his riches. But the most ordinary cause of a single life is liberty ; especially in certain self-pleasing and humourous minds, which are so sensible of every restraint, as they will go near to think

their girdles and garters to be bonds and shackles. Unmarried men are best friends, best masters, best servants, but not always best subjects; for they are light to run away; and almost all fugitives are of that condition. A single life doth well with churchmen: for charity will hardly water the ground, where it must first fill a pool. It is indifferent for judges and magistrates: for if they be facile and corrupt, you shall have a servant five times worse than a wife. For soldiers, I find the generals commonly, in their hortatives, put men in mind of their wives and children. And I think the despising of marriage amongst the Turks, maketh the vulgar soldiers more base. Certainly, wife and children are a kind of discipline of humanity; and single men, though they be many times more charitable, because their means are less exhaust; yet, on the other side, they are more cruel and hard-hearted, good to make severe inquisitors, because their tenderness is not so oft called upon. Grave natures, led by custom, and therefore constant, are commonly loving husbands: as was said of Ulysses, *vetulam suam prætulit immortalitati.* Chaste women are often proud and froward, as presuming upon the merit of their chastity. It is one of the best bonds, both of chastity and obedience, in the wife, if she think her husband wise: which she will never do if she find him jealous. Wives are young men's mistresses; companions for middle ages; and old men's nurses. So as a man may have a quarrel to marry when he will. But yet he was reputed one of the wise men, that made answer to the question, when a man should marry? "A young man not yet, an elder man not at all." It is often seen, that bad husbands have very good wives; whether it be, that it raiseth the price of their husband's kindness when it comes; or that the wives take a pride in their patience. But this never fails if the bad husbands were of their own chusing, against their friends' consent; for then they will be sure to make good their own folly.

IX. OF ENVY.

There be none of the affections which have been noted to fascinate or bewitch, but love and envy. They both have vehement wishes; they frame themselves readily into imaginations and suggestions: and they come easily into the eye; especially upon the presence of the objects; which are the points that conduce to fascination, if any such thing there be. We see likewise, the Scripture calleth envy an evil eye: and the astrologers call the evil influences of the stars, evil aspects; so that still there seemeth to be acknowledged in the act of envy, an ejaculation, or irradiation of the eye. Nay, some have been so curious, as to note, that the times when the stroke or percussion of an envious eye doth most hurt, are, when the party envied is beheld in glory or triumph; for that sets an edge upon envy: and, besides, at such times, the spirits of the person envied do come forth most into the outward parts, and so meet the blow.

But leaving these curiosities, though not unworthy to be thought on in fit place, we will handle, what persons are apt to envy others: what

persons are most subject to be envied themselves ; and what is the difference between public and private envy.

A man that hath no virtue in himself, ever envieth virtue in others. For men's minds will either feed upon their own good, or upon others' evil ; and who wanteth the one, will prey upon the other : and whoso is out of hope to attain to another's virtue, will seek to come at even hand by depressing another's fortune.

A man that is busy and inquisitive, is commonly envious : for to know much of other men's matters cannot be, because all that ado may concern his own estate : therefore it must needs be, that he taketh a kind of play-pleasure in looking upon the fortunes of others ; neither can he that mindeth but his own business find much matter for envy. For envy is a gadding passion, and walketh the streets, and doth not keep home ; " Non est curiosus, quin idem sit malevolus."

Men of noble birth are noted to be envious towards new men when they rise : for the distance is altered : and it is like a deceit of the eye, that when others come on, they think themselves go back.

Deformed persons and eunuchs, and old men and bastards, are envious : for he that cannot possibly mend his own case, will do what he can to impair another's ; except these defects light upon a very brave and heroical nature, which thinketh to make his natural wants part of his honour ; in that it should be said, that an eunuch or a lame man did such great matters ; affecting the honour of a miracle ; as it was in Narses the eunuch, and Agesilaus and Tamerlane, that were lame men.

The same is the case of men that rise after calamities and misfortunes ; for they are as men fallen out of the times ; and think other men's harms a redemption of their own sufferings.

They that desire to excel in too many matters, out of levity and vain-glory, are ever envious, for they cannot want work ; it being impossible but many, in some one of those things, should surpass them. Which was the character of Adrian the emperor, that mortally envied poets, and painters, and artificers, in works wherein he had a vein to excel.

Lastly, near kinsfolks, and fellows in office, and those that have been bred together, are more apt to envy their equals when they are raised. For it doth upbraid unto them their own fortunes, and pointeth at them, and cometh oftener in their remembrance, and incurreth likewise more into the note of others ; and envy ever redoubleth from speech and fame. Cain's envy was the more vile and malignant towards his brother Abel, because, when his sacrifice was better accepted, there was nobody to look on. Thus much for those that are apt to envy.

Concerning those that are more or less subject to envy : First, persons of eminent virtue, when they are advanced, are less envied. For their fortune seemeth but due unto them ; and no man envieth the payment of a debt, but rewards, and liberality rather. Again envy is ever joined with the comparing of a man's self ; and where there is no comparison no envy ; and therefore kings are not envied but by kings.

Nevertheless it is to be noted, that unworthy persons are most envied at their first coming in, and afterwards overcome it better ; whereas contrariwise, persons of worth and merit are most envied when their fortune continueth long. For by that time, though their virtue be the same, yet it hath not the same lustre ; for fresh men grow up that darken it.

Persons of noble blood are less envied in their rising ; for it seemeth but right done to their birth : besides, there seemeth not much added to their fortune : and envy is as the sun-beams, that beat hotter upon a bank or steep rising ground than upon a flat. And for the same reason, those that are advanced by degrees, are less envied than those that are advanced suddenly, and per saltum.

Those that have joined with their honour, great travels, cares, or perils, are less subject to envy : for men think that they earn their honours hardly, and pity them sometimes ; and pity ever healeth envy : wherefore you shall observe, that the more deep and sober sort of politic persons, in their greatness, are ever bemoaning themselves what a life they lead, chanting a "*Quanta patimur*:" not that they feel it so, but only to abate the edge of envy. But this is to be understood of business that is laid upon men, and not such as they call unto themselves : for nothing increaseth envy more, than an unnecessary and ambitious ingrossing of business : and nothing doth extinguish envy more, than for a great person to preserve all other inferior officers in their full rights and pre-eminences of their places : for by that means there be so many screens between him and envy.

Above all, those are most subject to envy, which carry the greatness of their fortunes in an insolent and proud manner : being never well but while they are showing how great they are, either by outward pomp, or by triumphing over all opposition or competition ; whereas wise men will rather do sacrifice to envy, in suffering themselves sometimes of purpose to be crossed and overborne in things that do not much concern them. Notwithstanding, so much is true : that the carriage of greatness in a plain and open manner, so it be without arrogancy and vain-glory, doth draw less envy, than if it be in a more crafty and cunning fashion. For in that course a man doth but disavow fortune, and seemeth to be conscious of his own want in worth, and doth but teach others to envy him.

Lastly, to conclude this part ; as we said in the beginning, that the act of envy had somewhat in it of witchcraft, so there is no other cure of envy, but the cure of witchcraft : and that is, to remove the lot, as they call it, and to lay it upon another. For which purpose, the wiser sort of great persons bring in ever upon the stage somebody upon whom to derive the envy that would come upon themselves : sometimes upon ministers and servants, sometimes upon colleagues and associates, and the like : and for that turn, there are never wanting some persons of violent and undertaking natures, who, so they may have power and business, will take it at any cost.

Now to speak of public envy. There is yet some good in public envy, whereas in private there is none. For public envy is as an ostra-

cism, that eclipseth men when they grow too great : and therefore it is a bridle also to great ones, to keep them within bounds.

This envy, being in the Latin word *invidia*, goeth in the modern languages by the name of discontent ; of which we shall speak in handling sedition. It is a disease in a state like to infection : for as infection spreadeth upon that which is sound, and tainteth it ; so when envy is gotten once into a state, it traduceth even the best actions thereof, and turneth them into an ill odour ; and therefore there is little won by intermingling of plausible actions : for that doth argue but a weakness and fear of envy, which hurteth so much the more ; as it is likewise usual in infections, which if you fear them, you call them upon you.

This public envy seemeth to beat chiefly upon principal officers or ministers, rather than upon kings and estates themselves. But this is a sure rule, that if the envy upon the minister be great, when the cause of it in him is small ; or if the envy be general in a manner upon all the ministers of an estate, then the envy, though hidden, is truly upon the estate itself. And so much of public envy or discontentment, and the difference thereof from private envy, which was handled in the first place.

We will add this in general touching the affection of envy : that of all other affections it is the most importune and continual : for of other affections there is occasion given but now and then ; and therefore it is well said, "*Invidia festos dies non agit* : " for it is ever working upon some other. And it is also noted, that love and envy do make a man pine, which other affections do not, because they are not so continual.

It is also the vilest affection, and the most depraved ; for which cause it is the proper attribute of the devil, who is called, " the envious man, that soweth tares among the wheat by night : " as it always cometh to pass, that envy worketh subtilly, and in the dark ; and to the prejudice of good things, such as is the wheat.

X. OF LOVE.

The stage is more beholden to love, than the life of man. For as to the stage, love is ever a matter of comedies, and now and then of tragedies ; but in life it doth much mischief, sometimes like a siren, sometimes like a fury. You may observe, that amongst all the great and worthy persons, whereof the memory remaineth, either ancient or recent, there is not one that hath been transported to the mad degree of love ; which shows, that great spirits and great business do keep out this weak passion. You must except nevertheless Marcus Antonius the half partner of the empire of Rome, and Appius Claudius the decemvir and lawgiver ; whereof the former was indeed a voluptuous man and inordinate ; but the latter was an austere and wise man : and therefore it seems, though rarely, that love can find entrance, not only into an open heart, but also into a heart well fortified, if watch be not well kept. It is a poor saying of Epicurus ; "*Satis magnum alter alteri theatrum sumus* : " as if man, made for the contemplation of heaven,

and all noble objects, should do nothing but kneel before a little idol, and make himself subject, though not of the mouth, as beasts are, yet of the eye, which was given him for higher purposes. It is a strange thing to note the excess of this passion; and how it braves the nature and value of things by this, that the speaking in a perpetual hyperbole is comely in nothing but in love. Neither is it merely in the phrase; for whereas it hath been well said, that the arch flatterer, with whom all the petty flatterers have intelligence, is a man's self; certainly the lover is more. For there was never proud man thought so absurdly well of himself as the lover doth of the person loved; and therefore it was well said, that it is impossible to love, and to be wise. Neither doth this weakness appear to others only, and not to the party loved, but to the loved most of all; except the love be reciproque. For it is a true rule, that love is ever rewarded either with the reciproque, or with an inward and secret contempt: by how much the more men ought to beware of this passion, which loseth not only other things, but itself. As for the other losses, the poet's relation doth well figure them; that he that preferred Helena, quitted the gifts of Juno and Pallas: for whosoever esteemeth too much of amorous affection, quitteth both riches and wisdom. This passion hath its floods in the very times of weakness, which are great prosperity, and great adversity; though this latter hath been less observed: which both times kindle love, and make it more fervent, and therefore, show it to be the child of folly. They do best, who, if they cannot but admit love, yet make it keep quarter; and sever it wholly from their serious affairs and actions of life: for if it check once with business, it troubleth men's fortunes, and maketh men that they can no ways be true to their own ends. I know not how, but martial men are given to love: I think it is, but as they are given to wine; for perils commonly ask to be paid in pleasures. There is in man's nature a secret inclination and motion towards love of others, which, if it be not spent upon some one or a few, doth naturally spread itself towards many, and maketh men to become humane and charitable; as it is seen sometime in frisks. Nuptial love maketh mankind; friendly love perfecteth it; but wanton love corrupteth and embaseth it.

XI. OF GREAT PLACE.

Men in great place are thrice servants: servants of the sovereign, or state; servants of fame; and servants of business: so as they have no freedom, neither in their persons, nor in their actions, nor in their times. It is a strange desire, to seek power, and to lose liberty; or to seek power over others, and to lose power over a man's self. The rising unto place is laborious; and by pains men come to greater pains; and it is sometimes base; and by indignities men come to dignities. The standing is slippery, and the regress is either a downfall, or at least an eclipse, which is a melancholy thing. "*Cum non sis qui fueris, non esse cur velis vivere?*" Nay, retire men cannot when they would; neither will they when it were reason; but are im-

patient of privateness, even in age and sickness, which require the shadow: like old townsmen, that will be still sitting at their street door, though thereby they offer age to scorn. Certainly great persons had need to borrow other men's opinions to think themselves happy; for if they judge by their own feeling, they cannot find it; but if they think with themselves what other men think of them, and that other men would fain be as they are, then they are happy as it were by report, when perhaps they find the contrary within. For they are the first that find their own griefs; though they be the last that find their own faults. Certainly men in great fortunes are strangers to themselves, and while they are in the puzzle of business, they have no time to tend their health either of body or mind. "*Illi mors gravis incubat, qui notus nimis omnibus, ignotus moritur sibi.*" In place there is licence to do good and evil; whereof the latter is a curse; for in evil the best condition is not to will; the second not to can. But power to do good is the true and lawful end of aspiring. For good thoughts, though God accept them, yet towards men are little better than good dreams, except they be put in act; and that cannot be without power and place; as the vantage and commanding ground. Merit and good works is the end of man's motion; and conscience of the same is the accomplishment of man's rest. For if a man can be partaker of God's theatre, he shall likewise be partaker of God's rest. "*Et conversus Deus, ut aspiceret opera, quæ fecerunt manus suæ, vidit quod omnia essent bona nimis;*" and then the sabbath. In the discharge of thy place, set before thee the best examples; for imitation is a globe of precepts. And after a time set before thee thine own example; and examine thyself strictly, whether thou didst not best at first. Neglect not also the examples of those that have carried themselves ill in the same place; not to set off thyself by taxing their memory; but to direct thyself what to avoid. Reform, therefore, without bravery or scandal of former times and persons; but yet set it down to thyself, as well to create good precedents, as to follow them. Reduce things to the first institution, and observe wherein and how they have degenerated; but yet ask counsel of both times: of the ancient time what is best; and of the latter time what is fittest. Seek to make thy course regular: that men may know beforehand what they may expect: but be not too positive and peremptory; and express thyself well when thou digressest from thy rule. Preserve the right of thy place, but stir not questions of jurisdiction: and rather assume thy right in silence, and *de facto*, than voice it with claims and challenges. Preserve likewise the rights of inferior places: and think it more honour to direct in chief than to be busy in all. Embrace and invite helps and advices touching the execution of thy place: and do not drive away such as bring thee information, as meddlers, but accept of them in good part. The vices of authority are chiefly four; delays, corruption, roughness, and facility. For delays: give easy access; keep times appointed; go through with that which is in hand; and interlace not business but of necessity. For corruption: do not only bind thine own hands, or thy servant's hand, from taking, but bind the hands of suitors also from offering.

For integrity used doth the one; but integrity professed, and with a manifest detestation of bribery, doth the other: and avoid not only the fault, but the suspicion. Whosoever is found variable, and changeth manifestly without manifest cause, giveth suspicion of corruption. Therefore always when thou changeth thine opinion or course, profess it plainly, and declare it, together with the reasons that move thee to change; and do not think to steal it. A servant or a favourite, if he be inward, and no other apparent cause of esteem, is commonly thought but a bye-way to close corruption. For roughness, it is a needless cause of discontent; severity breedeth fear, but roughness breedeth hate. Even reproofs from authority ought to be grave, and not taunting. As for facility, it is worse than bribery. For bribes come but now and then; but if importunity or idle respects lead a man, he shall never be without. As Solomon saith: "to respect persons is not good; for such a man will transgress for a piece of bread." It is more true that was anciently spoken, "A place sheweth the man:" and it sheweth some to the better, and some to the worse; "*omnium consensu, capax imperii, nisi imperasset,*" saith Tacitus of Galba: but of Vespasian he saith, "*solus imperantium Vespasianus mutatus in melius.*" Though the one was meant of sufficiency, the other of manners and affection. It is an assured sign of a worthy and generous spirit, whom honour amends: For honour is, or should be, the place of virtue: and as in nature things move violently to their place, and calmly in their place; so virtue in ambition is violent, in authority settled and calm. All rising to great place is by a winding-stair; and if there be factions, it is good to side a man's self whilst he is in the rising; and to balance himself when he is placed. Use the memory of thy predecessor fairly and tenderly; for if thou dost not, it is a debt will sure be paid when thou art gone. If thou have colleagues, respect them, and rather call them when they look not for it, than exclude them when they have reason to look to be called. Be not too sensible, or too remembering of thy place in conversation, and private answers to suitors: but let it rather be said, When he sits in place he is another man.

XII. OF BOLDNESS.

It is a trivial grammar-school text, but yet worthy a wise man's consideration. Question was asked of Demosthenes, what was the chief part of an orator? He answered, Action. What next?—Action. What next again?—Action. He said it that knew it best; and had by nature himself no advantage in that he commended. A strange thing, that that part of an orator, which is but superficial, and rather the virtue of a player, should be placed so high above those other noble parts of invention, elocution, and the rest: nay, almost alone, as if it were all in all. But the reason is plain. There is in human nature, generally, more of the fool than of the wise; and therefore those faculties by which the foolish part of men's minds is taken, are most potent. Wonderful like is the case of boldness in civil business; what first?—Boldness. What second and third?—Boldness.

And yet boldness is a child of ignorance and baseness, far inferior to other parts. But nevertheless it doth fascinate, and bind hand and foot those that are either shallow in judgment or weak in courage, which are the greatest part; yea, and prevaieth with wise men at weak times: therefore we see it hath done wonders in popular states, but with senates and princes less; and more ever upon the first entrance of bold persons into action, than soon after; for boldness is an ill keeper of promise. Surely, as there are mountebanks for the natural body, so there are mountebanks for the politic body: men that undertake great cures, and perhaps have been lucky in two or three experiments, but want the grounds of science, and therefore cannot hold out: nay, you shall see a bold fellow many times do Mahomet's miracle. Mahomet made the people believe that he would call an hill to him, and from the top of it offer up prayers for the observers of his law. The people assembled: Mahomet called the hill to come to him again and again; and when the hill stood still he was never a whit abashed, but said, "If the hill will not come to Mahomet, Mahomet will go to the hill." So these men, when they have promised great matters, failed most shamefully, yet, if they have the perfection of boldness, they will but slight it over, and make a turn, and no more ado. Certainly to men of great judgment bold persons are a sport to behold; nay, and to the vulgar also boldness hath somewhat of the ridiculous: for if absurdity be the subject of laughter, doubt you not but great boldness is seldom without some absurdity: especially it is a sport to see when a bold fellow is out of countenance, for that puts his face into a most shrunken and wooden posture, as needs it must; for in bashfulness the spirits do a little go and come; but with bold men, upon like occasion, they stand at a stay; like a stale at chess, where it is no mate, but yet the game cannot stir: but this last were fitter for a satire, than for a serious observation. This is well to be weighed, that boldness is ever blind; for it seeth not dangers and inconveniences: therefore it is ill in counsel, good in execution: so that the right use of bold persons is, that they never command in chief, but be seconds, and under the direction of others. For in counsel it is good to see dangers; and in execution not to see them, except they be very great.

XIII. OF GOODNESS, AND GOODNESS OF NATURE.

I take goodness in this sense, the affecting of the weal of men, which is that the Grecians call *philanthropia*: and the word humanity, as it is used, is a little too light to express it. Goodness I call the habit, and goodness of nature the inclination. This of all virtues and dignities of the mind is the greatest, being the character of the Deity; and without it man is a busy, mischievous, wretched thing, no better than a kind of vermin. Goodness answers to the theological virtue charity, and admits no excess but error. The desire of power in excess caused the angels to fall; the desire of knowledge in excess caused man to fall: but in charity there is no excess, neither can angel or

man come in danger by it. The inclination to goodness is imprinted deeply in the nature of man; insomuch, that if it issue not towards men, it will take unto other living creatures; as it is seen in the Turks, a cruel people, who nevertheless are kind to beasts, and give alms to dogs and birds : insomuch, as Busbechius reporteth, a Christian boy in Constantinople had like to have been stoned, for gagging, in a waggishness, a long-billed fowl. Errors, indeed, in this virtue of goodness or charity may be committed. The Italians have an ungracious proverb; "*Tanto buon che val niente*;" So good that he is good for nothing. And one of the doctors of Italy, Nicholas Machiavel, had the confidence to put in writing, almost in plain terms, that the Christian faith had given up good men in prey to those that are tyrannical and unjust : which he spake, because indeed there was never law, or sect, or opinion, did so much magnify goodness as the Christian religion doth : therefore to avoid the scandal and the danger both, it is good to take knowledge of the errors of an habit so excellent. Seek the good of other men, but be not in bondage to their faces or fancies; for that is but facility or softness which taketh an honest mind prisoner. Neither give thou *Æsop's* cock a gem, who would be better pleased and happier if he had a barley-corn. The example of God teacheth the lesson truly; "he sendeth his rain and maketh his sun to shine upon the just and the unjust;" but he doth not rain wealth nor shine honour and virtues upon men equally : common benefits are to be communicated with all, but peculiar benefits with choice. And beware, how in making the portraiture thou breakest the pattern : for divinity maketh the love of ourselves the pattern, the love of our neighbours but the portraiture : "*Sell all thou hast, and give it to the poor, and follow me.*" But sell not all thou hast, except thou come and follow me; that is, except thou have a vocation, wherein thou mayest do as much good with little means as with great : for otherwise, in feeding the streams thou driest the fountain. Neither is there only a habit of goodness directed by right reason; but there is in some men, even in nature, a disposition towards it; as on the other side there is a natural malignity. For there be that in their nature do not affect the good of others. The lighter sort of malignity turneth but to a crossness, or frowardness, or aptness to oppose, or diffidence, or the like, but the deeper sort to envy and mere mischief. Such men, in other men's calamities, are as it were in season, and are ever on the loading part : not so good as the dogs that licked Lazarus' sores, but like flies that are still buzzing upon anything that is raw; Misanthropy, that make it their practice to bring men to the bough, and yet have never a tree for the purpose in their gardens, as Timon had. Such dispositions are the very errors of human nature, and yet they are the fittest timber to make great politics of; like to knee-timber, that is good for ships that are ordained to be tossed, but not for building houses that shall stand firm. The parts and signs of goodness are many. If a man be gracious and courteous to strangers, it shows he is a citizen of the world, and that his heart is no island cut off from other lands, but a continent that joins to them. If he be compassionate

towards the afflictions of others, it shows that his heart is like the noble tree that is wounded itself when it gives the balm. If he easily pardons and remits offences, it shows that his mind is planted above injuries, so that he cannot be shot. If he be thankful for small benefits, it shows that he weighs men's minds, and not their trash. But above all, if he have St. Paul's perfection, that he would wish to be an anathema from Christ for the salvation of his brethren, it shows much of a divine nature, and a kind of conformity with Christ himself.

XIV. OF NOBILITY.

We will speak of nobility first as a portion of an estate, then as a condition of particular persons. A monarchy, where there is no nobility at all, is ever a pure and absolute tyranny; as that of the Turks; for nobility attempers sovereignty, and draws the eyes of the people somewhat aside from the line royal. But for democracies, they need it not; and they are commonly more quiet, and less subject to sedition, than where there are stirps of nobles; for men's eyes are upon the business, and not upon the persons: or if upon the persons, it is for the business' sake, as fittest, and not for flags and pedigree. We see the Switzers last well, notwithstanding their diversity of religion, and of cantons; for utility is their bond, and not respects. The United Provinces of the Low Countries, in their government, excel: for where there is an equality, the consultations are more indifferent, and the payments and tributes more cheerful. A great and potent nobility addeth majesty to a monarch, but diminisheth power; and putteth life and spirit into the people, but presseth their fortune. It is well when nobles are not too great for sovereignty, nor for justice; and yet maintained in that height, as the insolency of inferiors may be broken upon them, before it come on too fast upon the majesty of kings. A numerous nobility causeth poverty and inconvenience in a state, for it is a surcharge of expence; and besides, it being of necessity that many of the nobility fall in time to be weak in fortune, it maketh a kind of disproportion between honour and means.

As for nobility in particular persons: it is a reverend thing to see an ancient castle or building not in decay: or to see a fair timber tree sound and perfect; how much more to behold an ancient and noble family, which hath stood against the waves and weathers of time? for new nobility is the act of power, but ancient nobility is the act of time. Those that are first raised to nobility, are commonly more virtuous, but less innocent than their descendants; for there is rarely any rising, but by a commixture of good and evil arts: but it is reason the memory of their virtues remain to their posterity, and their faults die with themselves. Nobility of birth commonly abateth industry; and he that is not industrious envieth him that is. Besides, noble persons cannot go much higher; and he that standeth at a stay, when others rise, can hardly avoid motions of envy. On the other side, nobility extinguisheth the passive envy from others towards them, because they are in possession of honour. Certainly kings that have able men

of their nobility, shall find ease in employing them, and a better slide into their business: for people naturally bend to them, as born in some sort to command.

XV. OF SEDITIONS AND TROUBLES.

Shepherds of people had need know the kalendars of tempests in state; which are commonly greatest when things grow to equality: as natural tempests are greatest about the equinoctia. And as there are certain hollow blasts of wind, and secret swellings of seas, before a tempest, so are there in states:

Ille etiam cæcos instare tumultus
Sæpe monet, fraudesque et operta tumescere bella.

Libels and licentious discourses against the state, when they are frequent and open, and in like sort false news often running up and down to the disadvantage of the state, and hastily embraced, are amongst the signs of troubles. Virgil giving the pedigree of Fame, saith, she was sister to the giants.

* Illam Terra parens, ira irritata Deorum,
Extremam, ut perhibent, Cæo Enceladoque sororem
Progeniuit.

As if fames were the relicks of seditions past: but they are no less indeed the preludes of seditions to come. Howsoever he noteth it right, that seditious tumults, and seditious fames, differ no more, but as brother and sister, masculine and feminine; especially if it come to that, that the best actions of a state, and the most plausible, and which ought to give greatest contentment, are taken in ill sense and traduced: for that shows the envy great, as Tacitus saith; "conflata magna invidia, seu bene, seu male, gesta premunt." Neither doth it follow, that because these fames are a sign of troubles, that the suppressing of them with too much severity would be a remedy of troubles. For the despising of them many times checks them best: and the going about to stop them, doth but make a wonder long-lived. Also that kind of obedience which Tacitus speaketh of, is to be held suspected; "Erant in officio, sed tamen qui mallent mandata imperantium interpretari quam exequi;" disputing, excusing, cavilling upon mandates, and directions, is a kind of shaking off the yoke, and assay of disobedience: especially if in those disputings, they which are for the direction, speak fearfully and tenderly and those that are against it, audaciously.

Also, as Machiavel noteth well, when princes, that ought to be common parents, make themselves as a party, lean to a side, it is as a boat that is overthrown by uneven weight on the one side: as was well seen in the time of Henry the Third of France; for first, himself entered league for the extirpation of the protestants; and presently after the same league was turned upon himself. For when the authority of princes is made but an accessory to a cause, and that

be there other bands, that tie faster than the band of sovereignty, kings begin to be put almost out of possession.

Also, when discords and quarrels, and factions are carried openly and audaciously, it is a sign the reverence of government is lost. For the motions of the greatest persons in a government ought to be as the motions of the planets under *primum mobile*, according to the old opinion; which is, that every of them is carried swiftly by the highest motion, and softly in their own motion. And therefore when great ones in their own particular motion move violently, and, as Tacitus expresseth it well, "*liberius, quam ut imperantium meminissent*;" it is a sign the orbs are out of frame. For reverence is that wherewith princes are girt from God, who threateneth the dissolving thereof; "*solvam cingula regum*."

So when any of the four pillars of government are mainly shaken or weakened, which are religion, justice, counsel, and treasure, men had need to pray for fair weather. But let us pass from this part of predictions, concerning which, nevertheless, more light may be taken from that which followeth, and let us speak first of the materials of seditions; then of the motives of them; and thirdly, of the remedies.

Concerning the materials of seditions. It is a thing well to be considered; for the surest way to prevent seditions, if the times do bear it, is to take away the matter of them. For if there be fuel prepared, it is hard to tell whence the spark shall come that shall set it on fire. The matter of seditions is of two kinds: much poverty, and much discontentment. It is certain, so many overthrown estates, so many votes for troubles. Lucan noteth well the state of Rome before the civil war:

*Hinc usura vorax, rapidumque in tempore scenus,
Hinc concussa fides, et multis utile bellum.*

This same "*multis utile bellum*" is an assured and infallible sign of a state disposed to seditions and troubles. And if this poverty and broken estate in the better sort be joined with a want and necessity in the mean people, the danger is eminent and great. For the rebellions of the belly are the worst. As for discontentments, they are in the politic body like to humours in the natural, which are apt to gather a preternatural heat and to inflame. And let no prince measure the danger of them by this; whether they be just or unjust; for that were to imagine people to be too reasonable; who do often spurn at their own good; nor yet by this: whether the griefs whereupon they rise be in fact great or small. For they are the most dangerous discontentments, where the fear is greater than the feeling. "*Dolendi modus, timendi non item*." Besides, in great oppressions, the same things that provoke the patience, do withal mate the courage; but in fears it is not so. Neither let any prince or state be secure concerning discontentments, because they have been often, or have been long, and yet no peril hath ensued: for as it is true that every vapour, or fume, doth not turn into a storm: so it is nevertheless true, that storms, though they blow over divers times, yet may fall at last; and as the Spanish proverb noteth well, the cord breaketh at the last by the weakest pull.

The causes and motives of seditions are, innovation in religion, taxes, alteration of laws and customs, breaking of privileges, general oppression, advancement of unworthy persons, strangers, dearths, disbanded soldiers, factions grown desperate ; and whatsoever in offending people joineth and knitteth them in a common cause.

For the remedies, there may be some general preservative, whereof we will speak ; as for the just cure, it must answer to the particular disease : and so be left to counsel, rather than rule.

The first remedy or prevention, is to remove by all means possible that material cause of sedition, whereof we speak : which is want and poverty in the estate. To which purpose serveth the opening and well balancing of trade : the cherishing of manufactures : the banishing of idleness : the repressing of waste and excess by sumptuary laws : the improvement and husbanding of the soil : the regulating of prices of things vendible : the moderating of taxes and tributes, and the like. Generally it is to be foreseen, that the population of a kingdom, especially if it be not mown down by wars, do not exceed the stock of the kingdom which should maintain them. Neither is the population to be reckoned only by number : for a smaller number, that spend more, and earn less, do wear out an estate sooner than a greater number that live lower and gather more. Therefore the multiplying of nobility, and other degrees of quality, in an over proportion to the common people, doth speedily bring a state to necessity : and so doth likewise an overgrown clergy ; for they bring nothing to the stock : and in like manner, when more are bred scholars, than preferments can take off.

It is likewise to be remembered, that forasmuch as the increase of any estate must be upon the foreigner, for whatsoever is somewhere gotten is somewhere lost, there be but three things which one nation selleth unto another : the commodity as nature yieldeth it : the manufacture ; and the vecture or carriage. So that if these three wheels go, wealth will flow as in a spring tide. And it cometh many times to pass, that "*materia superabit opus*," that the work and carriage is more worth than the material, and enricheth a state more ; as is notably seen in the Low-Countrymen, who have the best mines above ground in the world.

Above all things good policy is to be used, that the treasure and moneys in a state be not gathered into few hands. For otherwise a state may have a great stock, and yet starve. And money is like mud, not good except it be spread. This is done chiefly by suppressing, or at the least keeping a strait hand upon, the devouring trades of usury, ingrossing, great pasturages, and the like.

For removing discontentments, or at least the danger of them : there is in every state, as we know, two portions of subjects, the noblesse, and the commonalty. When one of these is discontent, the danger is not great : for common people are of slow motion, if they be not excited by the greater sort ; and the greater sort are of small strength, except the multitude be apt and ready to move of themselves. Then is the danger, when the greater sort do but wait for the troubling

of the waters amongst the meaner, that then they may declare themselves. The poets feign, that the rest of the gods would have bound Jupiter; which he hearing of, by the counsel of Pallas, sent for Briareus with his hundred hands to come in to his aid. An emblem, no doubt, to show, how safe it is for monarchs to make sure of the good will of common people.

To give moderate liberty for griefs and discontentments to evaporate, so it be without too great insolency or bravery, is a safe way. For he that turneth the humours back, and maketh the wound bleed inwards, endangereth malign ulcers, and pernicious impostumations.

The part of Epimetheus might well become Prometheus, in the case of discontentments, for there is not a better provision against them. Epimetheus, when griefs and evils flew abroad, at last shut the lid, and kept Hope in the bottom of the vessel. Certainly the politic and artificial nourishing and entertaining of hopes, and carrying men from hopes to hopes, is one of the best antidotes against the poison of discontentments. And it is a certain sign of a wise government and proceeding, when it can hold men's hearts by hopes, when it cannot by satisfaction: and when it can handle things in such manner, as no evil shall appear so peremptory, but that it hath some outlet of hope; which is the less hard to do, because both particular persons and factions are apt enough to flatter themselves, or at least to brave that which they believe not.

Also, the foresight and prevention that there be no likely or fit head, whereunto discontented persons may resort, and under whom they may join, is a known but an excellent point of caution. I understand a fit head to be one that hath greatness and reputation; that hath confidence with the discontented party, and upon whom they turn their eyes; and that is thought discontented in his own particular: which kind of persons are either to be won and reconciled to the state, and that in a fast and true manner; or to be fronted with some other of the same party that may oppose them, and so divide the reputation. Generally, the dividing and breaking of all factions and combinations that are adverse to the state, and setting them at distance, or at least distrust amongst themselves, is not one of the worst remedies. For it is a desperate case, if those that hold with the proceedings of the state, be full of discord and faction; and those that are against it be entire and united.

I have noted, that some witty and sharp speeches which have fallen from princes, have given fire to seditions. Cæsar did himself infinite hurt in that speech; "*Sylla nescivit literas, non potuit dictare*:" for it did utterly cut off that hope which men had entertained, that he would at one time or other give over his dictatorship. Galba undid himself by that speech; "*Legi a se militem, non emi*:" for it put the soldiers out of the hope of the donative. Probus likewise by that speech, "*Si vixero, non opus erit amplius Romano imperio militibus*;" a speech of great despair for the soldiers: and many the like. Surely, princes had need, in tender matters and ticklish times, to beware what they say; especially in these short speeches, which fly abroad like darts, and are

thought to be shot out of their secret intentions. For, as for large discourses, they are flat things, and not so much noted.

Lastly, let princes, against all events, not be without some great person, one, or rather more, of military valour near unto them, for the repressing of seditions in their beginnings. For without that, there useth to be more trepidation in court upon the first breaking out of troubles, than were fit. And the state runneth the danger of that which Tacitus saith, "*atque is habitus animorum fuit, ut pessimum facinus auderent pauci, plures vellent, omnes paterentur.*" But let such military persons be assured and well reputed of, rather than factions and popular; holding also good correspondence with the other great men in the state; or else the remedy is worse than the disease.

XVI. OF ATHEISM.

I had rather believe all the fables in the Legend, and the Talmud, and the Alcoran, than that this universal frame is without a mind. And therefore God never wrought miracle to convince atheism, because his ordinary works convince it. It is true, that a little philosophy inclineth man's mind to atheism; but depth in philosophy bringeth men's minds about to religion; for while the mind of man looketh upon second causes scattered, it may sometimes rest in them, and go no farther; but when it beholdeth the chain of them confederate and linked together, it must needs fly to Providence and Deity. Nay, even that school which is most accused of atheism, doth most demonstrate religion; that is, the school of Leucippus, and Democritus, and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence daily and eternally placed, need no God; than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty without a divine marshal. The Scripture saith, "The fool hath said in his heart, There is no God:" it is not said, "the fool hath thought in his heart." So as he rather saith it by rote to himself, as that he would have, than that he can thoroughly believe it, or be persuaded of it. For none deny there is a God, but those for whom it maketh that there were no God. It appeareth in nothing more, that atheism is rather in the lip than in the heart of man, than by this; that atheists will ever be talking of that their opinion, as if they fainted in it within themselves, and would be glad to be strengthened by the consent of others: nay more, you shall have atheists strive to get disciples, as it fareth with other sects: and, which is most of all, you shall have of them that will suffer for atheism, and not recant; whereas if they did truly think that there were no such thing as God, why should they trouble themselves? Epicurus is charged, that he did but dissemble, for his credit's sake, when he affirmed there were blessed natures, but such as enjoyed themselves without having respect to the government of the world. Wherein they say he did temporize, though in secret he thought there was no God. But certainly he is traduced; for his words are noble and divine:

"Non deos vulgi negare profanum ; sed vulgi opiniones diis applicare profanum." Plato could have said no more. And although he had the confidence to deny the administration, he had not the power to deny the nature. The Indians of the west have names for their particular gods, though they have no name for God ; as if the heathens should have had the names Jupiter, Apollo, Mars, etc., but not the word *Deus* : which shows, that even those barbarous people have the notion, though they have not the latitude and extent of it. So that against atheists the very savages take part with the very subtlest philosophers. The contemplative atheist is rare ; a Diagoras, a Bion, a Lucian perhaps, and some others ; and yet they seem to be more than they are ; for that all that impugn a received religion, or superstition, are by the adverse part branded with the name of atheists. But the great atheists indeed are hypocrites ; which are ever handling holy things, but without feeling ; so as they must needs be cauterized in the end. The causes of atheism are ; divisions in religion, if they be many ; for any one main division addeth zeal to both sides ; but many divisions introduce atheism. Another is, scandal of priests ; when it is come to that which S. Bernard saith, "*non est jam dicere, ut populus, sic sacerdos : quia nec sic populus, ut sacerdos.*" A third is, custom of profane scoffing in holy matters ; which doth by little and little deface the reverence of religion. And lastly, learned times, especially with peace and prosperity : for troubles and adversities do more bow men's minds to religion. They that deny a God destroy man's nobility : for certainly man is of kin to the beasts by his body ; and if he be not of kin to God by his spirit, he is a base and ignoble creature. It destroys likewise magnanimity, and the raising of human nature : for take an example of a dog, and mark what a generosity and courage he will put on, when he finds himself maintained by a man ; who to him is instead of a God, or *melior natura* : which courage is manifestly such, as that creature, without that confidence of a better nature than his own, could never attain. So man, when he resteth and assureth himself upon divine protection and favour, gathereth a force and faith, which human nature in itself could not obtain : therefore as atheism is in all respects hateful, so in this, that it depriveth human nature of the means to exalt itself above human frailty. As it is in particular persons, so it is in nations : never was there such a state for magnanimity as Rome ; of this state hear what Cicero saith : "*Quam volumus, licet, patres, conscripti, nos amemus, tamen nec numero Hispanos, nec robore Gallos, nec calliditate Pœnos, nec artibus Græcos, nec denique hoc ipso hujus gentis et terre domestico nativoque sensu Italos ipsos et Latinos ; sed pietate, ac religione, atque hac in a sapientia, quod decum immortalium numine omnia regi gubernarique perspeximus, omnes gentes nationesque superavimus*"

XVII. OF SUPERSTITION.

It were better to have no opinion of God at all, than such an opinion as is unworthy of him : for the one is unbelief, the other is

contumely : and certainly superstition is the reproach of the Deity. Plutarch saith well to that purpose : " Surely," saith he, " I had rather a great deal men should say, there was no such man at all as Plutarch, than that they should say, that there was one Plutarch, that would eat his children as soon as they were born ; as the poets speak of Saturn." And as the contumely is greater towards God, so the danger is greater towards men. Atheism leaves a man to sense, to philosophy, to natural piety, to laws, to reputation ; all which may be guides to an outward moral virtue, though religion were not : but superstition dismounts all these, and erecteth an absolute monarchy in the minds of men. Therefore atheism did never perturb states ; for it makes men wary of themselves, as looking no further ; and we see the times inclined to atheism, as the time of Augustus Cæsar, were civil times. But superstition hath been the confusion of many states ; and bringeth in a new primum mobile, that ravisheth all the spheres of government. The master of superstition is the people ; and in all superstition wise men follow fools ; and arguments are fitted to practice in a reversed order. It was gravely said by some of the prelates in the Council of Trent, where the doctrine of the schoolmen bare great sway ; that the schoolmen were like astronomers, which did feign eccentricities and epicycles, and such engines of orbs, to save the phenomena, though they knew there were no such things ; and in like manner, that the schoolmen had framed a number of subtle and intricate axioms and theorems, to save the practice of the Church. The causes of superstition are : pleasing and sensual rites and ceremonies ; excess of outward and pharisaical holiness ; over-great reverence of traditions, which cannot but load the Church ; the stratagems of prelates for their own ambition and lucre ; the favouring too much of good intentions, which openeth the gate to conceits and novelties ; the taking an aim at divine matters by human, which cannot but breed mixture of imaginations ; and lastly, barbarous times, especially joined with calamities and disasters. Superstition without a veil is a deformed thing : for as it addeth deformity to an ape to be so like a man ; so the similitude of superstition to religion makes it the more deformed. And as wholesome meat corrupteth to little worms, so good forms and orders corrupt into a number of petty observances. There is a superstition in avoiding superstition ; when men think to do best, if they go farthest from the superstition formerly received : therefore care would be had, that, as it fareth in ill purgings, the good be not taken away with the bad, which commonly is done when the people is the reformer.

XVIII. OF TRAVEL.

Travel in the younger sort is a part of education ; in the elder a part of experience. He that travelleth into a country before he hath some entrance into the language, saith to school, and not to travel. That young men travel under some tutor or private servant, I allow well ; so that he be such a one that hath the language, and hath been in the country before ; whereby he may be able to tell them what

things are worthy to be seen in the country where they go, what acquaintances they are to seek, what exercises or discipline the place yieldeth. For else young men shall go hooded, and look abroad little. It is a strange thing, that in sea-voyages, where there is nothing to be seen but sky and sea, men should make diaries; but in land-travel, wherein so much is to be observed, for the most part they omit it: as if chance were fitter to be registered than observation. Let diaries therefore be brought in use. The things to be seen and observed are: the courts of princes, especially when they give audience to ambassadors: the courts of justice, while they sit and hear causes: and so of consistories ecclesiastic: the churches and monasteries, with the monuments which are therein extant: the walls and fortifications of cities and towns, and so the havens and harbours: antiquities and ruins; libraries, colleges, disputations, and lectures, where any are; shipping and navies: houses, and gardens of state and pleasure near great cities; armories, arsenals, magazines, exchanges, burses, ware-houses; exercises of horsemanship, fencing, training of soldiers and the like; comedies, such whereunto the better sort of persons do resort; treasuries of jewels and robes, cabinets and rarities: and to conclude, whatsoever is memorable in the places where they go. After all which, the tutors or servants ought to make diligent inquiry. As for triumphs, masks, feasts, weddings, funerals, capital executions, and such shows, men need not so be put in mind of them; yet they are not to be neglected. If you will have a young man to put his travel into a little room, and in short time to gather much, this you must do: first, as was said, he must have some entrance into the language before he goeth. Than he must have such a servant, or tutor, as knoweth the country, as was likewise said. Let him carry with him also some card or book describing the country where he travelleth, which will be a good key to his inquiry. Let him keep also a diary. Let him not stay long in one city or town; more or less as the place serveth, but not long: nay, when he stayeth in one city or town, let him change his lodging from one end and part of the town to another which is a great adamant of acquaintance. Let him sequester himself from the company of his countrymen, and diet in such places where there is good company of the nation where he travelleth. Let him, upon his removes from one place to another, procure recommendation to some person of quality residing in the place whither he removeth, that he may use his favour in those things he desireth to see or know. Thus he may abridge his travel with much profit. As for the acquaintance which is to be sought in travel, that which is most of all profitable is acquaintance with the secretaries and employed men of ambassadors; for so in travelling in one country, he shall suck the experience of many. Let him also see and visit eminent persons in all kinds, which are of great name abroad; that he may be able to tell how the life agreeth with the fame. For quarrels they are with care and discretion to be avoided: they are commonly for mistresses, healths, place, and words. And let a man beware how he keepeth company with choleric and quarrelsome persons; for they will engage

him into their own quarrels. When a traveller returneth home, let him not leave the countries where he hath travelled altogether behind him, but maintain a correspondence by letters with those of his acquaintance which are of most worth. And let his travel appear rather in his discourse than in his apparel or gesture; and in his discourse, let him be rather advised in his answers than forward to tell stories: and let it appear that he doth not change his country manners for those of foreign parts; but only prick in some flowers of that he hath learned abroad, into the customs of his own country.

XIX. OF EMPIRE.

It is a miserable state of mind to have few things to desire, and many things to fear: and yet that commonly is the case of kings, who being at the highest, want matter of desire, which makes their minds more languishing; and have many representations of perils and shadows, which makes their minds the less clear. And this is one reason also of that effect which the Scripture speaketh of, "that the king's heart is inscrutable." For multitude of jealousies, and lack of some predominant desire, that should marshal and put in order all the rest, maketh any man's heart hard to find or sound. Hence it comes likewise, that princes many times make themselves desires, and set their hearts upon toys: sometimes upon a building; sometimes upon erecting of an order; sometimes upon the advancing of a person; sometimes upon obtaining excellency in some art, or feat of the hand; as Nero for playing on the harp; Domitian for certainty of the hand with the arrow; Commodus for playing at fence; Caracalla for driving chariots, and the like. This seemeth incredible unto those that know not the principle. That the mind of man is more cheered and refreshed by profiting in small things than by standing at a stay in great. We see also, that kings that have been fortunate conquerors in their first years, it being not possible for them to go forward infinitely, but that they must have some check or arrest in their fortunes, turn in their latter years to be superstitious and melancholy: as did Alexander the Great, Dioclesian, and in our memory Charles the fifth, and others; for he that is used to go forward, and findeth a stop, falleth out of his own favour, and is not the thing he was.

To speak now of the true temper of empire: it is a thing rare and hard to keep; for both temper and distemper consist of contraries. But it is one thing to mingle contraries, another to interchange them. The answer of Apollonius to Vespasian is full of excellent instructions. Vespasian asked him, what was Nero's overthrow? He answered, Nero could touch and tune the harp well, but in government sometimes he used to wind the pins too high, sometimes to let them down too low. And certain it is, that nothing destroyeth authority so much as the unequal and untimely interchange of power pressed too far, and relaxed too much.

This is true, that the wisdom of all these latter times, in princes' affairs, is rather fine deliveries, and shiftings of dangers and mischiefs,

when they are near, than solid and grounded courses to keep them aloof. But this is but to try masteries with fortune : and let men beware how they neglect and suffer matter of trouble to be prepared ; for no man can forbid the spark, nor tell whence it may come. The difficulties in princes' business are many and great ; but the greatest difficulty is often in their own mind. For it is common with princes, saith Tacitus, to will contradictories. "*Sunt plerumque regum voluntates, vehementes, et inter se contrariæ.*" For it is the solecism of power, to think to command the end, and yet not to endure the mean.

Kings have to deal with their neighbours ; their wives ; their children ; their prelates or clergy ; their nobles ; their second nobles or gentlemen ; their merchants ; their commons ; and their men of war ; and from all these arise dangers, if care and circumspection be not used.

First for their neighbours, there can no general rule be given, the occasions are so variable, save one, which ever holdeth ; which is, that princes do keep due sentinel, that none of their neighbours do overgrow so, by increase of territory, by embracing of trade, by approaches, or the like, as they become more able to annoy them, than they were. And this is generally the work of standing counsels, to foresee and to hinder it. During that triumvirate of kings, King Henry the Eighth, of England ; Francis the First, king of France ; and Charles the Fifth, emperor, there was such a watch kept that none of the three could win a palm of ground, but the other two would straightways balance it, either by confederation, or if need were by a war : and would not in any wise take up peace at interest. And the like was done by that league, which, Guicciardine saith, was the security of Italy, made between Ferdinando, king of Naples ; Lorenzious Medices, and Ludovicus Sforza, potentates, the one of Florence, the other of Milan. Neither is the opinion of some of the schoolmen to be received, that a war cannot justly be made but upon a precedent injury or provocation. For there is no question but a just fear of an imminent danger, though there be no blow given, is a lawful cause of a war.

For their wives, there are cruel examples of them. Livia is infamed for the poisoning of her husband ; Roxolana, Solyman's wife, was the destruction of that renowned prince, Sultan Mustapha ; and otherwise troubled his house and succession : Edward the second of England, his queen had the principal hand in the deposing and murder of her husband. This kind of danger is then to be feared, chiefly, when the wives have plots for the raising their own children, or else that they be advowtresses.

For their children : the tragedies likewise of the dangers from them have been many : and generally, the entering of the fathers into suspicion of their children hath been ever unfortunate. The destruction of Mustapha, that we named before, was so fatal to Solyman's line, as the succession of the Turks, from Solyman until this day, is suspected to be untrue, and of strange blood ; for that Selymus the second was thought to be supposititious. The destruction of Crispus, a young prince of rare towardness, by Constantine the Great, his father, was in

like manner fatal to his house ; for both Constantinus and Constans, his sons, died violent deaths ; and Constantinus his other son did little better ; who died indeed of sickness, but after that Julianus had taken arms against him. The destruction of Demetrius, son to Philip the second of Macedon, turned upon the father, who died of repentance. And many like examples there are ; but few or none where the fathers had good by such distrust, except it were where the sons were up in open arms against them ; as was Selymus the first against Bajazet : and the three sons of Henry the second, king of England.

For their prelates, when they are proud and great, there is also danger from them : as it was in the times of Anselmus and Thomas Becket, archbishops of Canterbury, who with their crosiers did almost try it with the king's sword ; and yet they had to deal with stout and haughty kings, William Rufus, Henry the first, and Henry the second. The danger is not from that state, but where it hath a dependence of foreign authority ; or where the churchmen come in, and are elected, not by the collation of the king or particular patrons, but by the people.

For their nobles ; to keep them at a distance it is not amiss ; but to depress them may make a king more absolute, but less safe ; and less able to perform anything that he desires. I have noted it in my "History of King Henry the seventh of England," who depressed his nobility ; whereupon it came to pass that his times were full of difficulties and troubles : for the nobility though they continued loyal unto him, yet did they not co-operate with him in his business. So that in effect he was fain to do all things himself.

For their second nobles ; there is not much danger from them, being a body dispersed. They may sometimes discourse high, but that doth little hurt : besides, they are a counterpoise to the higher nobility, that they grow too potent : and lastly, being the most immediate in authority with the common people, they do best temper popular commotions.

For their merchants, they are *vena porta* ; and if they flourish not, a kingdom may have good limbs, but will have empty veins, and nourish little. Taxes and imposts upon them do seldom good to the king's revenue, for that that he wins in the hundred, he loseth in the shire ; the particular rates being increased, but the total bulk of trading rather decreased.

For their commons, there is little danger from them, except it be where they have great and potent heads ; or where you meddle with the point of religion, or their customs, or means of life.

For their men of war, it is a dangerous state where they live and remain in a body, and are used to donatives, whereof we see examples in the janizaries, and pretorian bands of Rome ; but trainings of men, and arming them in several places, and under several commanders, and without donatives, are things of defence and no danger.

Princes are like to heavenly bodies, which cause good or evil times ; and which have much veneration, but no rest. All precepts concerning kings are in effect comprehended in those two remembrances :

"Memento quod es homo;" and "Memento quod es Deus," or "vice Dei:" the one bridleth their power, and the other their will.

XX. OF COUNSEL.

The greatest trust between man and man is the trust of giving counsel. For in other confidences, men commit the parts of life; their lands, their goods, their children, their credit, some particular affair; but to such as they make their counsellors, they commit the whole: by how much the more they are obliged to all faith and integrity. The wisest princes need not think it any diminution to their greatness, or derogation to their sufficiency, to rely upon counsel. God himself is not without: but hath made it one of the great names of his blessed Son, "the Counsellor." Solomon hath pronounced, that "in counsel is stability." Things will have their first or second agitation; if they be not tossed upon the arguments of counsel, they will be tossed upon the waves of fortune; and be full of inconstancy, doing and undoing, like the reeling of a drunken man. Solomon's son found the force of counsel, as his father saw the necessity of it. For the beloved kingdom of God was first rent and broken by ill counsel; upon which counsel there are set, for our instruction, the two marks whereby bad counsel is for ever best discerned: that it was young counsel, for the persons; and violent counsel, for the matter.

The ancient times do set forth in figure both the incorporation and inseparable conjunction of counsel with kings, and the wise and politic use of counsel by kings: the one, in that they say Jupiter did marry Metis, which signifieth counsel; whereby they intend, that sovereignty is married to counsel: the other in that which followeth, which was thus: they say, after Jupiter was married to Metis, she conceived by him and was with child, but Jupiter suffered her not to stay till she brought forth, but eat her up: whereby he became himself with child, and was delivered of Pallas armed out of his head. Which monstrous fable containeth a secret of empire; how kings are to make use of their council of state: that, first, they ought to refer matters unto them, which is the first begetting or impregnation; but when they are elaborate, moulded and shaped in the womb of their council, and grow ripe and ready to be brought forth, that then they suffer not their council to go through with the resolution and direction, as if it depended on them; but take the matter back into their own hands, and make it appear to the world, that the degrees and final directions, which, because they come forth with prudence and power, are resembled to Pallas armed, proceeded from themselves, and not only from their authority, but, the more to add reputation to themselves, from their head and device.

Let us now speak of the inconveniences of counsel, and of the remedies. The inconveniences that have been noted in calling and using counsel are three. First, the revealing of affairs, whereby they become less secret. Secondly, the weakening of the authority of princes, as if they were less of themselves. Thirdly, the danger of being unfaith-

fully counselled, and more for the good of them that counsel, than of him that is counselled. For which inconveniences the doctrine of Italy, and practice of France, in some kings' times, hath introduced cabinet counsels : a remedy worse than the disease.

As to secrecy, princes are not bound to communicate all matters with all counsellors, but may extract and select. Neither is it necessary, that he that consulteth what he should do, should declare what he will do. But let princes beware, that the unsecreting of their affairs comes not from themselves. And as for cabinet counsels, it may be their motto ; "*Plenus rimarum sum* : " one futile person, that maketh it his glory to tell, will do more hurt than many that know it their duty to conceal. It is true, there be some affairs which require extreme secrecy, which will hardly go beyond one or two persons besides the king : neither are those counsels unprosperous ; for besides the secrecy, they commonly go on constantly in one spirit of direction without distraction. But then it must be a prudent king, such as is able to grind with a hand-mill ; and those inward counsellors had need also to be wise men, and especially true and trusty to the king's ends ; as it was with king Henry the seventh of England, who in his greatest business imparted himself to none, except it were to Morton and Fox.

For weakening of authority ; the fable sheweth the remedy. Nay, the majesty of kings is rather exalted than diminished, when they are in the chair of counsel ; neither was there any prince bereaved of his dependencies by his council, except where there hath been either an over-greatness in one counsellor, or an over-strict combination in divers ; which are things soon found and holpen.

For the last inconvenience, that men will counsel with an eye to themselves : certainly "*Non inveniet fidem super terram*" is meant of the nature of times, and not of all particular persons. There be that are in nature faithful and sincere, and plain and direct ; not crafty and involved : let princes above all draw to themselves such natures. Besides, counsellors are not commonly so united, but that one counsellor keepeth sentinel over another ; so that if any do counsel out of faction or private ends, it commonly comes to the king's ear. But the best remedy is, if princes know their counsellors, as well as their counsellors know them :

Principis est virtus maxima nosse suos.

And on the other side, counsellors should not be too speculative into their sovereign's person. The true composition of a counsellor is rather to be skilful in their master's business, than in his nature ; for then he is like to advise him, and not to feed his humour. It is of singular use to princes, if they take the opinions of their council both separately and together : for private opinion is more free, but opinion before others is more reverend. In private, men are more bold in their own humours ; and in consort, men are more obnoxious to others' humours ; therefore it is good to take both : and of the inferior sort, rather in private, to preserve freedom ; of the greater, rather in consort, to preserve respect. It is in vain for princes to take

counsel concerning matters, if they take no counsel likewise concerning persons: for all matters are as dead images; and the life of the execution of affairs resteth in the good choice of persons. Neither is it enough to consult concerning persons *secundum genera*, as in an idea or mathematical description, what the kind and character of the person should be; for the greatest errors are committed, and the most judgment is shown, in the choice of individuals. It was truly said, "*optimi consiliarii mortui*;" books will speak plain, when counsellors blanch. Therefore it is good to be conversant in them, specially the books of such as themselves have been actors upon the stage.

The councils at this day, in most places, are but familiar meetings; where matters are rather talked on, than debated: and they run too swift to the order or act of council. It were better, that in causes of weight the matter were propounded one day, and not spoken to till the next day; "*in nocte consilium*." So was it done in the commission of union between England and Scotland; which was a grave and orderly assembly. I commend set days for petitions: for both it gives the suitors more certainty for their attendance; and it frees the meetings for matters of estate, that they may *hoc agere*. In choice of committees, for ripening business for the council, it is better to choose indifferent persons, than to make an indifferency by putting in those that are strong on both sides. I commend also standing commissions; as for trade, for treasure, for war, for suits, for some provinces; for where there be divers particular councils, and but one council of estate, as it is in Spain, they are, in effect, no more than standing commissions; save that they have greater authority. Let such as are to inform councils out of their particular professions, as lawyers, seamen, mintmen, and the like, be first heard before committees; and then, as occasion serves, before the council. And let them not come in multitudes, or in a tribunitious manner; for that is to clamour councils, not to inform them. A long table, and a square table, or seats about the walls, seem things of form, but are things of substance; for at a long table, a few at the upper end, in effect, sway all the business; but in the other form, there is more use of the counsellors' opinions that sit lower. A king when he presides in council, let him beware how he opens his own inclination too much in that which he propoundeth: for else counsellors will but take the wind of him, and instead of giving free counsel sing him a song of Placebo.

XXI. OF DELAYS.

Fortune is like the market, where many times if you can stay a little, the price will fall. And again, it is sometimes like Sibylla's offer, which at first offereth the commodity at full, then consumeth part and part, and still holdeth up the price. For occasion, as it is in the common verse, turneth a bald noddle, after she hath presented her locks in front, and no hold taken: or at least turneth the handle of the bottle first to be received, and after the belly, which is hard to clasp. There is surely no greater wisdom, than well to time the beginnings and onsets of things. Dangers are no more light, if they once seem light:

and more dangers have deceived men, than forced them. Nay, it were better to meet some dangers half way, though they come nothing near, than to keep too long a watch upon their approaches ; for if a man watch too long, it is odds he will fall asleep. On the other side, to be deceived with too long shadows, as some have been when the moon was low, and shone on their enemies' back, and so to shoot off before the time ; or to teach dangers to come on, by over-early buckling towards them, is another extreme. The ripeness or unripeness of the occasion, as we said, must ever be well weighed ; and generally it is good to commit the beginnings of all great actions to Argus with his hundred eyes, and the ends to Briareus with his hundred hands ; first to watch, and then to speed. For the helmet of Pluto, which maketh the politic man go invisible, is secrecy in the counsel, and celerity in the execution. For when things are once come to the execution, there is no secrecy comparable to celerity ; like the motion of a bullet in the air, which flieth so swift as it outruns the eye.

XXII. OF CUNNING.

We take cunning for a sinister or crooked wisdom. And certainly there is great difference between a cunning man and a wise man ; not only in point of honesty, but in point of ability. There be that can pack the cards, and yet cannot play well ; so there are some that are good in canvasses and factions, that are otherwise weak men. Again, it is one thing to understand persons, and another thing to understand matters : for many are perfect in men's humours, that are not greatly capable of the real part of business : which is the constitution of one that hath studied men more than books. Such men are fitter for practice than for counsel ; and they are good but in their own alley : turn them to new men, and they have lost their aim : so as the old rule to know a fool from a wise man, "*Mitte ambos nudos ad ignotos, et videbis,*" doth scarce hold for them. And because these cunning men are like haberdashers of small wares, it is not amiss to set forth their shop.

It is a point of cunning, to wait upon him with whom you speak with your eye ; as the Jesuits give it in precept ; for there be many wise men that have secret hearts and transparent countenances. Yet this would be done with a demure abashing of your eye sometimes, as the Jesuits also do use.

Another is, that when you have anything to obtain of present despatch, you entertain and amuse the party with whom you deal with some other discourse ; that he be not too much awake to make objections. I knew a counsellor and secretary, that never came to queen Elizabeth of England with bills to sign, but he would always first put her into some discourse of estate, that she might the less mind the bills.

The like surprise may be made by moving things when the party is in haste, and cannot stay to consider advisedly of that is moved.

If a man would cross a business, that he doubts some other would

handsomely and effectually move, let him pretend to wish it well, and move it himself in such sort as may foil it.

The breaking off in the midst of that one was about to say, as if he took himself up, breeds a greater appetite in him with whom you confer, to know more.

And because it works better when anything seemeth to be gotten from you by question, than if you offer it of yourself, you may lay a bait for a question, by showing another visage and countenance than you are wont : to the end to give occasion for the party to ask what the matter is of the change ; as Nehemiah did, " And I had not before that time been sad before the king."

In things that are tender and displeasing, it is good to break the ice by some whose words are of less weight, and to reserve the more weighty voice to come in as by chance, so that he may be asked the question upon the other's speech ; as Narcissus did, in relating to Claudius the marriage of Messalina and Silius.

In things that a man would not be seen in himself, it is a point of cunning to borrow the name of the world ; as to say, The world says, or, There is a speech abroad.

I knew one, that when he wrote a letter, he would put that which was most material in the postscript, as if it had been a by-matter.

I knew another, that when he came to have speech, he would pass over that that he intended most ; and go forth, and come back again, and speak of it as a thing that he had almost forgot.

Some procure themselves to be surprised at such times, as it is like the party that they work upon will suddenly come upon them ; and to be found with a letter in their hand, or doing somewhat which they are not accustomed ; to the end they may be apposed of those things, which of themselves they are desirous to utter.

It is a point of cunning to let fall those words in a man's own name, which he would have another man learn and use, and thereupon take advantage. I knew two that were competitors for the secretary's place in queen Elizabeth's time, and yet kept good quarter between themselves, and would confer one with another upon the business ; and the one of them said, that to be a secretary in the declination of a monarchy was a ticklish thing, and that he did not affect it : the other straight caught up those words, and discoursed with divers of his friends, that he had no reason to desire to be secretary in the declination of a monarchy. The first man took hold of it, and found means it was told the queen ; who hearing of a declination of the monarchy, took it so ill, as she would never after hear of the other's suit.

There is a cunning which we in England call, the turning of the cat in the pan ; which is, when that which a man saith to another, he lays it as if another had said it to him ; and to say truth, it is not easy, when such a matter passed between two, to make it appear from which of them it first moved and began.

It is a way that some men have, to glance and dart at others, by justifying themselves by negatives ; as to say, This I do not : as

Tigellinus did towards Burrhus, "*se non diversas spes, sed incolumitatem imperatoris simpliciter spectare.*"

Some have in readiness so many tales and stories, as there is nothing they would insinuate, but they can wrap it into a tale ; which serveth both to keep themselves more in guard, and to make others carry it with more pleasure.

It is a good point in cunning, for a man to shape the answer he would have in his own words and propositions ; for it makes the other party stick the less.

It is strange how long some men will lie in wait to speak somewhat they desire to say ; and how far about they will fetch, and how many other matters they will beat over to come near it ; it is a thing of great patience, but yet of much use.

A sudden, bold, and unexpected question, doth many times surprise a man, and lay him open. Like to him, that having changed his name, and walking in Paul's, another suddenly came behind him, and called him by his true name, whereat straightways he looked back.

But these small wares and petty points of cunning are infinite, and it were a good deed to make a list of them ; for that nothing doth more hurt in a state, than that cunning men pass for wise.

But certainly some there are that know the resorts and falls of business, that cannot sink into the main of it ; like a house that hath convenient stairs and entries, but never a fair room. Therefore you shall see them find out pretty looses in the conclusion, but are no ways able to examine or debate matters. And yet commonly they take advantage of their inability, and would be thought wits of direction. Some build rather upon the abusing of others, and, as we now say, putting tricks upon them, than upon soundness of their own proceedings. But Solomon saith, "*Prudens advertit ad gressus suos : stultus divertit ad dolos.*"

XXIII. OF WISDOM FOR A MAN'S SELF.

An ant is a wise creature for itself : but it is a shrewd thing in an orchard or garden. And certainly men that are great lovers of themselves waste the public. Divide with reason between self-love and society ; and be so true to thyself, as thou be not false to others ; especially to thy king and country. It is a poor centre of a man's actions, Himself. It is right earth. For that only stands fast upon his own centre : whereas all things that have affinity with the heavens, move upon the centre of another which they benefit. The referring of all to a man's self is more tolerable in a sovereign prince, because themselves are not only themselves, but their good and evil is at the peril of the public fortune. But it is a desperate evil in a servant to a prince, or a citizen in a republic. For whatsoever affairs pass such a man's hands, he crooketh them to his own ends : which must needs be often eccentric to the ends of his master or state. Therefore let princes or states choose such servants as have not this mark ; except they mean their service should be made but the accessary. That

which maketh the effect more pernicious is, that all proportion is lost : it were disproportion enough for the servant's good to be preferred before the master's ; but yet it is a greater extreme, when a little good of the servant shall carry things against a great good of the master's. And yet that is the case of bad officers, treasurers, ambassadors, generals, and other false and corrupt servants ; which set a bias upon their bowl of their own petty ends and envies, to the overthrow of their master's great and important affairs. And for the most part, the good such servants receive, is after the model of their own fortune ; but the hurt they sell for that good, is after the model of their master's fortune. And certainly it is the nature of extreme self-lovers, as they will set an house on fire, and it were but to roast their eggs : and yet these men many times hold credit with their masters, because their study is but to please them, and profit themselves : and for either respect they will abandon the good of their affairs.

Wisdom for a man's self is in many branches thereof a depraved thing. It is the wisdom of rats, that will be sure to leave a house somewhat before it fall. It is the wisdom of the fox, that thrusts out the badger, who digged and made room for him. It is the wisdom of crocodiles, that shed tears when they would devour. But that which is specially to be noted is, that those which, as Cicero says of Pompey, are "*sui amantes sine rivale*," are many times unfortunate. And whereas they have all their time sacrificed to themselves, they become in the end themselves sacrifices to the inconstancy of fortune, whose wings they thought by their self-wisdom to have pinioned.

XXIV. OF INNOVATIONS.

As the births of living creatures at first are ill shapen ; so are all innovations, which are the births of time. Yet notwithstanding as those that first bring honour into their family, are commonly more worthy than most that succeed : so the first precedent, if it be good, is seldom attained by imitation. For ill, to man's nature, as it stands perverted, hath a natural motion strongest in continuance : but good, as a forced motion, strongest at first. Surely every medicine is an innovation, and he that will not apply new remedies, must expect new evils ; for time is the greatest innovator : and if time of course alter things to the worse, and wisdom and counsel shall not alter them to the better, what shall be the end ? It is true, that what is settled by custom, though it be not good, yet at least it is fit. And those things which have long gone together, are, as it were, confederate within themselves : whereas new things piece not so well ; but though they help by their utility, yet they trouble by their inconformity. Besides, they are like strangers, more admired, and less favoured. All this is true if time stood still ; which contrariwise moveth so round, that a froward retention of custom is as turbulent a thing as an innovation : and they that reverence too much old times are but a scorn to the new. It were good therefore, that men in their innovations would follow the example of time itself, which indeed innovateth greatly, but

quietly and by degrees scarce to be perceived : for otherwise, whatsoever is new is unlooked for ; and ever it mends some, and impairs others : and he that is holpen takes it for a fortune, and thanks the time ; and he that is hurt, for a wrong, and imputeth it to the author. It is good also not to try experiments in states, except the necessity be urgent, or the utility evident ; and well to beware that it be the reformation that draweth on the change, and not the desire of change that pretendeth the reformation. And lastly, that the novelty, though it be not rejected, yet be held for a suspect : and, as the Scripture saith, "that we make a stand upon the ancient way, and then look about us, and discover what is the straight and right way, and so to walk in it."

XXV. OF DESPATCH.

Affected despatch is one of the most dangerous things to business that can be. It is like that which the physicians call predigestion, or hasty digestion, which is to fill the body full of crudities and secret seeds of diseases. Therefore measure not despatch by the times of sitting, but by the advancement of the business. And as in races, it is not the large stride, or high lift, that makes the speed ; so in business, the keeping close to the matter, and not taking of it too much at once, procureth despatch. It is the care of some, only to come off speedily for the time ; or to contrive some false periods of business, because they may seem men of despatch. But it is one thing to abbreviate by contracting, another by cutting off : and business so handled at several sittings or meetings, goeth commonly backward and forward in an unsteady manner. I know a wise man that had it for a by-word, when he saw men hasten to a conclusion, "Stay a little, that we may make an end the sooner."

On the other side, true despatch is a rich thing. For time is the measure of business, as money is of wares ; and business is bought at a dear hand, where there is small despatch. The Spartans and Spaniards have been noted to be of small despatch : "*Mi venga la muerte de Spagna ;*" Let my death come from Spain ; for then it will be sure to be long in coming.

Give good hearing to those that give the first information in business : and rather direct them in the beginning, than interrupt them in the continuance of their speeches : for he that is put out of his own order, will go forward and backward, and be more tedious while he waits upon his memory, than he could have been if he had gone on in his own course. But sometimes it is seen, that the moderator is more troublesome than the actor.

Iterations are commonly loss of time : but there is no such gain of time, as to iterate often the state of the question ; for it chaseth away many a frivolous speech as it is coming forth. Long and curious speeches are as fit for despatch, as a robe or a mantle with a long train is for race. Prefaces, and passages, and excusations, and other speeches of reference to the person, are great wastes of time ; and though they seem to proceed of modesty, they are bravery. Yet

beware of being too material, when there is any impediment or obstruction in men's wills ; for pre-occupation of mind ever requireth preface of speech ; like a fomentation to make the unguent enter.

Above all things, order, and distribution, and singling out of parts, is the life of despatch : so as the distribution be not too subtil : for he that doth not divide, will never enter well into business : and he that divideth too much, will never come out of it clearly. To choose time, is to save time ; and an unseasonable motion is but beating the air. There be three parts of business ; the preparation, the debate or examination, and the perfection. Whereof, if you look for despatch, let the middle only be the work of many, and the first and last the work of few. The proceeding upon somewhat conceived in writing, doth for the most part facilitate despatch : for though it should be wholly rejected, yet that negative is more pregnant of direction than an indefinite ; as ashes are more generative than dust.

XXVI. OF SEEMING WISE.

It hath been an opinion, that the French are wiser than they seem, and the Spaniards seem wiser than they are. But howsoever it be between nations, certainly it is so between man and man. For as the apostle saith of godliness, "having a show of godliness, but denying the power thereof ;" so certainly there are in point of wisdom and sufficiency that do nothing or little very solemnly ; "magno conatu nugas." It is a ridiculous thing, and fit for a satire to persons of judgment, to see what shifts these formalists have, and what prospectives to make superficies to seem body that hath depth and bulk. Some are so close and reserved, as they will not show their wares but by a dark light ; and seem always to keep back somewhat ; and when they know within themselves, they speak of that they do not well know, would nevertheless seem to others to know of that which they may not well speak. Some help themselves with countenance and gesture, and are wise by signs ; as Cicero saith of Piso, that when he answered him, he fetched up one of his brows up to his forehead, and bent the other down to his chin : "respondes, altero ad frontem sublato, altero ad mentum depresso supercilio, crudelitatem tibi non placere." Some think to bear it by speaking a great word, and being peremptory ; and go on, and take by admittance that which they cannot make good. Some, whatsoever is beyond their reach, will seem to despise or make light of it as impertinent or curious ; and so would have their ignorance seem judgment. Some are never without a difference, and commonly, by amusing men with a subtilty, blanch the matter ; of whom A. Gellius saith, "hominem delirum, qui verborum minutis rerum frangit pondera." Of which kind also, Plato in his "Protagoras" bringeth in Prodicus in scorn, and maketh him make a speech that consisteth of distinctions from the beginning to the end. Generally such men in all deliberations find ease to be of the negative side, and affect a credit to object and foretel difficulties : for when propositions are denied, there is an end of them ; but if they be

allowed, it requireth a new work : which false point of wisdom is the bane of business. To conclude, there is no decaying merchant, or inward beggar, hath so many tricks to uphold the credit of their wealth, as these empty persons have to maintain the credit of their sufficiency. Seeming wise men may make shift to get opinion ; but let no man choose them for employment, for certainly you were better take for business a man somewhat absurd, than over formal.

XXVII. OF FRIENDSHIP.

It had been hard for him that spake it to have put more truth and untruth together, in few words, than in that speech ; "Whosoever is delighted in solitude, is either a wild beast, or a God." For it is most true, that a natural and secret hatred, and aversion towards society, in any man, hath somewhat of the savage beast : but it is most untrue, that it should have any character at all of the divine nature, except it proceed, not out of a pleasure in solitude, but out of a love and desire to sequester a man's self for a higher conversation : such as is found to have been falsely and feignedly in some of the heathen ; as Epimenides the Candian, Numa the Roman, Empedocles the Sicilian, and Apollonius of Tyana ; and truly and really in divers of the ancient hermits and holy fathers of the Church. But little do men perceive what solitude is, and how far it extendeth. For a crowd is not company, and faces are but a gallery of pictures ; and talk but a tinkling cymbal, where there is no love. The Latin adage meeteth with it a little ; "*Magna civitas, magna solitudo* ;" because in a great town friends are scattered, so that there is not that fellowship, for the most part, which is in less neighbourhoods. But we may go farther, and affirm most truly, that it is a mere and miserable solitude, to want true friends, without which the world is but a wilderness. And even in this sense also of solitude, whosoever in the frame of his nature and affections is unfit for friendship, he taketh it of the beast, and not from humanity.

A principal fruit of friendship is the ease and discharge of the fulness and swellings of the heart, which passions of all kinds do cause and induce. We know diseases of stoppings and suffocations are the most dangerous in the body ; and it is not much otherwise in the mind ; you may take sarza to open the liver, steel to open the spleen, flour of sulphur for the lungs, castoreum for the brain ; but no receipt openeth the heart but a true friend, to whom you may impart griefs, joys, fears, hopes, suspicions, counsels, and whatsoever lieth upon the heart, to oppress it, in a kind of civil shrift or confession.

It is a strange thing to observe, how high a rate great kings and monarchs do set upon this fruit of friendship, whereof we speak ; so great, as they purchase it many times at the hazard of their own safety and greatness. For princes, in regard of the distance of their fortune from that of their subjects and servants, cannot gather this fruit, except, to make themselves capable thereof, they raise some persons to be as it were companions, and almost equals to themselves, which

many times sorteth to inconvenience. The modern languages give unto such persons the name of favourites or privadoes, as if it were matter of grace or conversation : but the Roman name attaineth the true use and cause thereof, naming them "*participes curarum*;" for it is that which tieth the knot. And we see plainly, that this hath been done, not by weak and passionate princes only, but by the wisest and most politic that ever reigned, who have oftentimes joined to themselves some of their servants, whom both themselves have called friends, and allowed others likewise to call them in the same manner, using the word which is received between private men.

L. Sylla, when he commanded Rome, raised Pompey, after sur-named the Great, to that height, that Pompey vaunted himself for Sylla's over-match. For when he had carried the consulship for a friend of his against the pursuit of Sylla, and that Sylla did a little resent thereat, and began to speak great, Pompey turned upon him again, and in effect bade him be quiet : for that more men adored the sun rising, than the sun setting. With Julius Cæsar Decimus Brutus had obtained that interest, as he set him down in his testament for heir in remainder after his nephew. And this was the man that had power with him to draw him forth to his death. For when Cæsar would have discharged the senate, in regard of some ill presages, and especially a dream of Calpurnia, this man lifted him gently by the arm out of his chair, telling him, He hoped he would not dismiss the senate till his wife had dreamed a better dream. And it seemeth, his favour was so great, as Antonius, in a letter which is recited verbatim in one of Cicero's Philippics, calleth him "*venefica*," witch ; as if he had enchanted Cæsar. Augustus raised Agrippa, though of mean birth, to that height, as when he consulted with Mæcenus about the marriage of his daughter Julia, Mæcenus took the liberty to tell him, That he must either marry his daughter to Agrippa, or take away his life ; there was no third way, he had made him so great. With Tiberius Cæsar Sejanus had ascended to that height, as they two were termed and reckoned as a pair of friends. Tiberius in a letter to him saith : "*Hæc pro amicitia nostra non occultavi*:" and the whole senate dedicated an altar to friendship as to a goddess, in respect of the great dearness of friendship between them two. The like or more was between Septimus Severus and Plantianus. For he forced his eldest son to marry the daughter of Plantianus, and would often maintain Plantianus in doing affronts to his son : and did write also in a letter to the senate, by these words : "I love the man so well, as I wish he may over-live me." Now if these princes had been as a Trajan, or a Marcus Aurelius, a man might have thought that this had proceeded of an abundant goodness of nature ; but being men so wise, of such strength and severity of mind, and so extreme lovers of themselves, as all these were ; it proveth most plainly, that they found their own felicity, though as great as ever happened to mortal men, but as an half piece, except they might have a friend to make it entire ; and yet, which is more, they were princes which had wives, sons, nephews ; and yet all these could not supply the comfort of friendship.

It is not to be forgotten what Comminius observeth of his first master duke Charles the Hardy, namely, That he would communicate his secrets with none ; and least of all those secrets which troubled him most. Whereupon he goeth on, and saith, That towards his latter time, that closeness did impair, and a little perish his understanding. Surely Comminius might have made the same judgment also, if it had pleased him, of his second master Lewis the eleventh, whose closeness was indeed his tormentor. The parable of Pythagoras is dark, but true ; “*Cor ne edito,*” eat not the heart. Certainly, if a man would give it a hard phrase, those that want friends to open themselves unto, are cannibals of their own hearts. But one thing is most admirable, wherewith I will conclude this first fruit of friendship, which is, that this communicating of a man’s self to his friend works two contrary effects ; for it redoubleth joys, and cutteth griefs in halves. For there is no man that imparteth his joys to his friends, but he joyeth the more ; and no man that imparteth his griefs to his friend, but he grieveth the less. So that it is in truth of operation upon a man’s mind of like virtue, as the alchemists used to attribute to their stone, for man’s body ; that it worketh all contrary effects, but still to the good and benefit of nature. But yet, without praying in aid of alchemists, there is a manifest image of this in the ordinary course of nature. For in bodies, union strengtheneth and cherisheth any natural action ; and, on the other side, weakeneth and dulbeth any violent impression ; and even so it is of minds.

The second fruit of friendship is healthful and sovereign for the understanding, as the first is for the affections. For friendship maketh indeed a fair day in the affections, from storm and tempests ; but it maketh daylight in the understanding, out of darkness and confusion of thoughts : neither is this to be understood only of faithful counsel, which a man receiveth from his friend ; but before you come to that, certain it is, that whosoever hath his mind fraught with many thoughts, his wits and understanding do clarify and break up in the communicating and discoursing with another : he tosseth his thoughts more easily ; he marshalleth them more orderly ; he seeth how they look when they are turned into words ; finally, he waxeth wiser than himself ; and that more by an hour’s discourse, than by a day’s meditation. It was well said by Themistocles to the king of Persia, That speech was like cloth of Arras, opened and put abroad, whereby the imagery doth appear in figure ; whereas in thoughts they lie but as in packs. Neither is this second fruit of friendship, in opening the understanding, restrained only to such friends, as are able to give a man counsel : they indeed are best : but even, without that, a man learneth of himself and bringeth his own thoughts to light, and whetteth his wits as against a stone, which itself cuts not. In a word, a man were better relate himself to a statue or picture, than to suffer his thoughts to pass in smother.

Add now, to make this second fruit of friendship complete, that other point which lieth more open, and falleth within vulgar observation ; which is faithful counsel from a friend. Heraclitus saith well in

one of his enigmas, Dry light is ever the best. And certain it is, that the light that a man receiveth by counsel from another is drier and purer, than that which cometh from his own understanding and judgment; which is ever infused and drenched in his affections and customs. So as there is as much difference between the counsel that a friend giveth, and that a man giveth himself, as there is between the counsel of a friend and of a flatterer. For there is no such flatterer as is a man's self; and there is no such remedy against flattery of a man's self, as the liberty of a friend. Counsel is of two sorts; the one concerning manners, the other concerning business. For the first, the best preservative to keep the mind in health is the faithful admonition of a friend. The calling a man's self to a strict account is a medicine sometimes too piercing and corrosive. Reading good books of morality is a little flat and dead. Observing our faults in others is sometimes improper for our case: but the best receipt, best, I say, to work, and best to take, is the admonition of a friend. It is a strange thing to behold what gross errors and extreme absurdities many, especially of the greater sort, do commit for want of a friend to tell them of them, to the great damage both of their fame and fortune. For as St. James saith, they are as men "that look sometimes into a glass, and presently forget their own shape and favour." As for business, a man may think if he will, that two eyes see no more than one; or that a gamester seeth always more than a looker-on; or that a man in anger is as wise as he that hath said over the four and twenty letters; or that a musket may be shot off as well upon the arm as upon a rest; and such other fond and high imaginations, to think himself all in all. But when all is done, the help of good counsel is that which setteth business straight. And if any man think that he will take counsel, but it shall be by pieces; asking counsel in one business of one man, and in another business of another man; it is well, that is to say, better perhaps than if he asked none at all, but he runneth two dangers: one, that he shall not be faithfully counselled; for it is a rare thing, except it be from a perfect and entire friend, to have counsel given, but such as shall be bowed and crooked to some ends which he hath that giveth it. The other, that he shall have counsel given, hurtful and unsafe, though with good meaning, and mixed partly of mischief, and partly of remedy: even as if you would call a physician that is thought good for the cure of the disease you complain of, but is unacquainted with your body; and therefore may put you in way for a present cure, but overthroweth your health in some other kind, and so cure the disease and kill the patient. But a friend that is wholly acquainted with a man's estate, will beware by furthering any present business how he dasheth upon other inconvenience. And therefore rest not upon scattered counsels; they will rather distract and mislead, than settle and direct.

After these two noble fruits of friendship, peace in the affections, and support of the judgment, followeth the last fruit, which is like the pomegranate, full of many kernels; I mean aid, and bearing a part in all actions and occasions. Here the best way to represent to life the manifold use of friendship, is to cast and see how many things there

are which a man cannot do himself; and then it will appear that it was a sparing speech of the ancients to say, That a friend is another himself; for that a friend is far more than himself. Men have their time, and die many times in desire of some things which they principally take to heart; the bestowing of a child, the finishing of a work, or the like. If a man have a true friend, he may rest almost secure, that the care of those things will continue after him. So that a man hath as it were two lives in his desires. A man hath a body, and that body is confined to a place; but where friendship is, all offices of life are as it were granted to him and his deputy: for he may exercise them by his friend. How many things are there which a man cannot with any face or comeliness, say or do himself? A man can scarce alledge his own merits with modesty, much less extol them: a man cannot sometimes brook to supplicate or beg; and a number of the like. But all these things are graceful in a friend's mouth, which are blushing in a man's own. So again, a man's person hath many proper relations, which he cannot put off. A man cannot speak to his son, but as a father; to his wife, but as a husband; to his enemy but upon terms; whereas a friend may speak as the case requires, and not as it sorteth with the person. But to enumerate these things were endless; I have given a rule, where a man cannot fitly play his own part; if he have not a friend, he may quit the stage.

XXVIII. OF EXPENCE.

Riches are for spending; and spending for honour and good actions. Therefore extraordinary expence must be limited by the worth of the occasion; for voluntary undoing may be as well for a man's country, as for the kingdom of heaven. But ordinary expence ought to be limited by a man's estate, and governed with such regard as it be within his compass; and not subject to deceit and abuse of servants; and ordered to the best show, that the bills may be less than the estimation abroad. Certainly if a man will keep but of even hand, his ordinary expences ought to be but to the half of his receipts; and if he think to wax rich, but to the third part. It is no baseness for the greatest, to descend and look into their own estate. Some forbear it, not upon negligence alone, but doubting to bring themselves into melancholy, in respect they shall find it broken. But wounds cannot be cured without searching. He that cannot look into his own estate at all, had need both choose well them whom he employeth, and change them often: for new are more timorous and less subtle. He that can look into his estate but seldom, it becometh him to turn all to certainties. A man had need, if he be plentiful in some kind of expence, to be as saving again in some other. As if he be plentiful in diet, to be saving in apparel: if he be plentiful in the hall, to be saving in the stable: and the like. For he that is plentiful in expences of all kinds, will hardly be preserved from decay. In clearing of a man's estate, he may as well hurt himself in being too sudden, as in letting it run on too long: for hasty selling is commonly as disadvantageable

as interest. Besides, he that clears at once will relapse ; for finding himself out of straits, he will revert to his customs ; but he that cleareth by degrees induceth a habit of frugality, and gaineth as well upon his mind as upon his estate. Certainly, who hath a state to repair, may not despise small things : and commonly it is less dishonourable to abridge petty charges, than to stoop to petty gettings. A man ought warily to begin charges, which once begun will continue ; but in matters that return not, he may be more magnificent.

XXIX. OF THE TRUE GREATNESS OF KINGDOMS AND ESTATES.

The speech of Themistocles the Athenian, which was haughty and arrogant in taking so much to himself, had been a grave and wise observation and censure, applied at large to others. Desired at a feast to touch a lute, he said, He could not fiddle, but yet he could make a small town a great city. These words, holpen a little with a metaphor, may express two differing abilities in those that deal in business of estate. For if a true survey be taken of counsellors and statesmen, there may be found, though rarely, those which can make a small state great, and yet cannot fiddle ; as on the other side, there will be found a great many that can fiddle very cunningly, but yet are so far from being able to make a small state great, as their gift lieth the other way ; to bring a great and flourishing estate to ruin and decay. And certainly those degenerate arts and shifts, whereby many counsellors and governors gain both favour with their masters, and estimation with the vulgar, deserve no better name than fiddling ; being things rather pleasing for the time, and graceful to themselves only, than tending to the weal and advancement of the state which they serve. There are also, no doubt, counsellors and governors which may be held sufficient, *negotiiis pares*, able to manage affairs, and to keep them from precipices and manifest inconveniences, which nevertheless are far from the ability to raise and amplify an estate, in power, means, and fortune. But be the workmen what they may be, let us speak of the work ; that is, the true greatness of kingdoms and estates, and the means thereof. An argument fit for great and mighty princes to have in their hand ; to the end that neither by over-measuring their forces they lose themselves in vain enterprises ; nor on the other side, by undervaluing them, they descend to fearful and pusillanimous counsels.

The greatness of an estate in bulk and territory doth fall under measure, and the greatness of finances and revenue doth fall under computation. The population may appear by musters ; and the number and greatness of cities and towns by cards and maps. But yet there is not any thing amongst civil affairs more subject to error, than the right valuation and true judgment concerning the power and forces of an estate. The kingdom of heaven is compared, not to any great kernel or nut, but to a grain of mustard-seed ; which is one of the least grains, but hath in it a property and spirit hastily to get up and spread. So are there states, great in territory, and yet not apt to

enlarge or command ; and some that have but a small dimension of stem, and yet apt to be the foundations of great monarchies.

Walled towns, stored arsenals and armouries, goodly races of horse, chariots of war, elephants, ordnance, artillery, and the like : all this is but a sheep in a lion's skin, except the breed and disposition of the people be stout and warlike. Nay, number itself, in armies, importeth not much, where the people is of weak courage ; for, as Virgil saith, it never troubles a wolf how many the sheep be. The army of the Persians, in the plains of Arbela, was such a vast sea of people, as it did somewhat astonish the commanders in Alexander's army, who came to him therefore, and wished him to set upon them by night ; but he answered, he would not pilfer the victory : and the defeat was easy. When Tigranes the Armenian, being encamped upon a hill with four hundred thousand men, discovered the army of the Romans, being not above fourteen thousand, marching towards him ; he made himself merry with it, and said, "Yonder men are too many for an embassy, and too few for a fight." But before the sun set, he found them enow to give him the chase, with infinite slaughter. Many are the examples of the great odds between number and courage : so that a man may truly make a judgment, that the principal point of greatness in any state is to have a race of military men. Neither is money the sinews of war, as it is trivially said, where the sinews of men's arms, in base and effeminate people, are failing. For Solon said well to Cræsus, when in ostentation he showed him his gold, "Sir, if any other come that hath better iron than you, he will be master of all this gold." Therefore let any prince or state think soberly of his forces, except his militia of natives be of good and valiant soldiers. And let princes, on the other side, that have subjects of martial disposition, know their own strength, unless they be otherwise wanting unto themselves. As for mercenary forces, which is the help in this case, all examples show, that whatsoever estate or prince doth rest upon them, he may spread his feathers for a time, but he will mew them soon after.

The blessing of Judah and Issachar will never meet ; that the same people or nation should be both the lion's whelp, and the ass between burdens. Neither will it be, that a people overlaid with taxes should ever become valiant and martial. It is true, that taxes levied by consent of the estate do abate men's courage less ; as it hath been seen notably in the excises of the Low Countries ; and, in some degree, in the subsidies of England. For you must note, that we speak now of the heart, and not of the purse. So that although the same tribute and tax, laid by consent, or by imposing, be all one to the purse, yet it works diversely upon the courage. So that you may conclude, that no people overcharged with tribute is fit for empire.

Let states that aim at greatness take heed how their nobility and gentlemen do multiply too fast ; for that maketh the common subject grow to be a peasant and base swain, driven out of heart, and in effect but the gentleman's labourer. Even as you may see in coppice woods ; if you leave your staddles too thick, you shall never have clean under-

wood, but shrubs and bushes. So in countries, if the gentlemen be too many, the commons will be base ; and you will bring it to that, that not the hundred poll will be fit for an helmet ; especially as to the infantry, which is the nerve of an army : and so there will be great population, and little strength. This which I speak of, hath been nowhere better seen, than by comparing of England and France ; whereof England, though far less in territory and population, hath been, nevertheless, an overmatch ; in regard the middle people of England make good soldiers, which the peasants of France do not. And herein the device of king Henry the seventh, whereof I have spoken largely in the history of his life, was profound and admirable . in making farms, and houses of husbandry, of a standard ; that is, maintained with such a proportion of land unto them, as may breed a subject to live in convenient plenty, and no servile condition ; and to keep the plough in the hands of the owners, and not mere hirelings. And thus indeed you shall attain to Virgil's character, which he gives to ancient Italy :

Terra potens armis, atque ubere glebæ.

Neither is that state, which, for anything I know, is almost peculiar to England, and hardly to be found anywhere else, except it be perhaps in Poland, to be passed over ; I mean the state of free servants, and attendants upon noblemen and gentlemen, which are no ways inferior unto the yeomanry for arms : and therefore out of all question, the splendour and magnificence, and great retinues, and hospitality of noblemen and gentlemen, received into custom doth much conduce unto martial greatness : whereas, contrariwise, the close and reserved living of noblemen and gentlemen causeth a penury of military forces.

By all means it is to be procured, that the trunk of Nebuchadnezzar's tree of monarchy be great enough to bear the branches and the boughs ; that is, that the natural subjects of the crown or state bear a sufficient proportion to the stranger subjects that they govern. Therefore all states that are liberal of naturalization towards strangers, are fit for empire. For to think that an handful of people can, with the greatest courage and policy in the world, embrace too large extent of dominion, it may hold for a time, but it will fail suddenly. The Spartans were a nice people in point of naturalization ; whereby, while they kept their compass, they stood firm ; but when they did spread, and their boughs were become too great for their stem, they became a windfall upon the sudden. Never any state was, in this point, so open to receive strangers into their body, as were the Romans ; therefore it sorted with them accordingly, for they grew to the grandest monarchy. Their manner was to grant naturalization, which they called "*jus civitatis*," and to grant it in the highest degree, that is, not only "*jus commercii*, *jus connubii*, *jus hereditatis*," but also "*jus suffragii*," and "*jus honorum* : " and this not to singular persons alone, but likewise to whole families ; yea, to cities, and sometimes to nations. Add to this, their custom of plantation of colonies, whereby the Roman plant

was removed into the soil of other nations: and putting both constitutions together, you will say, that it was not the Romans that spread upon the world, but it was the world that spread upon the Romans: and that was the sure way of greatness. I have marvelled sometimes at Spain, how they clasp and contain so large dominions, with so few natural Spaniards: but sure the whole compass of Spain is a very great body of a tree, far above Rome and Sparta at the first. And besides, though they have not had that usage, to naturalize liberally, yet they have that which is next to it; that is, to employ, almost indifferently, all nations in their militia of ordinary soldiers: yea, and sometimes in their highest commands. Nay, it seemeth at this instant they are sensible of this want of natives; as by the pragmatical sanction, now published, appeareth.

It is certain, that sedentary and within-door arts, and delicate manufactures, that require rather the finger than the arm, have in their nature a contrariety to a military disposition. And generally all war-like people are a little idle, and love danger better than travail: neither must they be too much broken of it, if they shall be preserved in vigour. Therefore it was great advantage in the ancient states of Sparta, Athens, Rome, and others, that they had the use of slaves, which commonly did rid those manufacturers. But that is abolished, in greatest part, by the Christian law. That which cometh nearest to it, is, to leave those arts chiefly to strangers, which for that purpose are the more easily to be received, and to contain the principal bulk of the vulgar natives within those three kinds: tillers of the ground, free-servants, and handicraftsmen of strong and manly arts, as smiths, masons, carpenters, etc., not reckoning professed soldiers.

But above all, for empire and greatness, it importeth most, that a nation do profess arms as their principal honour, study, and occupation. For the things which we formerly have spoken of are but habilitations towards arms; and what is habilitation without intention and act? Romulus, after his death, as they report or feign, sent a present to the Romans, that above all they should intend arms, and then they should prove the greatest empire of the world. The fabric of the state of Sparta was wholly, though not wisely, framed and composed to that scope and end. The Persians and Macedonians had it for a flash. The Gauls, Germans, Goths, Saxons, Normans, and others, had it for a time. The Turks have it at this day, though in great declination. Of Christian Europe, they that have it are in effect only the Spaniards. But it is so plain, that every man profiteth in that he most intendeth, that it needeth not to be stood upon. It is enough to point at it; that no nation, which doth not directly profess arms, may look to have greatness fall into their mouths. And on the other side, it is a most certain oracle of time, that those states that continue long in that profession, as the Romans and Turks principally have done, do wonders: and those that have professed arms but for an age, have notwithstanding commonly attained that greatness in that age, which maintained them long after, when their profession and exercise of arms hath grown to decay.

Incident to this point is, for a state to have those laws or customs, which may reach forth unto them just occasions, as may be pretended, of war. For there is that justice imprinted in the nature of men, that they enter not upon wars, whereof so many calamities do ensue, but upon some, at the least specious, grounds and quarrels. The Turk hath at hand, for cause of war, the propagation of his law or sect ; a quarrel that he may always command. The Romans, though they esteemed the extending the limits of their empire to be great honour to their generals, when it was done : yet they never rested upon that alone to begin a war. First therefore, let nations that pretend to greatness have this, that they may be sensible of wrongs, either upon borderers, merchants, or politic ministers ; and that they sit not too long upon a provocation. Secondly, let them be prest, and ready to give aids and succours to their confederates ; as it ever was with the Romans : insomuch as if the confederate had leagues defensive with divers other states, and, upon invasion offered, did implore their aids severally, yet the Romans would ever be the foremost, and leave it to none other to have the honour. As for the wars, which were anciently made on the behalf of a kind of party, or tacit conformity of estate, I do not see how they may be well justified ; as when the Romans made a war for the liberty of Græcia ; or when the Lacedæmonians and Athenians made wars, to set up or pull down democracies and oligarchies ; or when wars were made by foreigners, under the pretence of justice or protection, to deliver the subjects of others from tyranny and oppression ; and the like. Let it suffice, that no estate expect to be great, that is not awake upon any just occasion of arming.

No body can be healthful without exercise, neither natural body nor politic : and certainly, to a kingdom or estate, a just and honourable war is the true exercise. A civil war, indeed, is like the heat of a fever ; but a foreign war is like the heat of exercise, and serveth to keep the body in health. For in a slothful peace, both courages will effeminate, and manners corrupt. But howsoever it be for happiness, without all question, for greatness it maketh, to be still, for the most part, in arms : and the strength of a veteran army, though it be a chargeable business, always on foot, is that which commonly giveth the law, or at least the reputation amongst all neighbour states, as may well be seen in Spain : which hath had, in one part or other, a veteran army, almost continually, now by the space of six-score years.

To be master of the sea, is an abridgement of a monarchy. Cicero writing to Atticus, of Pompey his preparation against Cæsar, saith, "*Consilium Pompeii plane Themistocleum est ; putat enim, qui mari potitur, cum rerum potiri.*" And without doubt Pompey had tired out Cæsar, if upon vain confidence he had not left that way. We see the great effects of battles by sea. The battle of Actium decided the empire of the world. The battle of Lepanto arrested the greatness of the Turk. There be many examples, where sea fights have been final to the war ; but this is, when princes or states have set up their rest upon the battles. But this much is certain ; that he that commands the sea is at great liberty, and may take as much and as little of the war as he

will. Whereas those that be strongest by land are many times, nevertheless, in great straits. Surely, at this day, with us of Europe, the vantage of strength at sea, which is one of the principal dowries of this kingdom of Great Britain, is great : both because most of the kingdoms of Europe are not merely inland, but girt with the sea, most part of their compass ; and because the wealth of both Indies seems in great part but an accessory to the command of the seas.

The wars of latter ages seem to be made in the dark, in respect of the glory and honour which reflected upon men from the wars in ancient time. There be now, for martial encouragement, some degrees and orders of chivalry, which nevertheless are conferred promiscuously upon soldiers and no soldiers : and some remembrance perhaps upon the escutcheon, and some hospitals for maimed soldiers, and such like things. But in ancient times the trophies erected upon the place of the victory ; the funeral laudatives and monuments for those that died in the wars ; the crowns and garlands personal ; the stile of emperor, which the great kings of the world after borrowed ; the triumphs of the generals upon their return ; the great donatives and largesses upon the disbanding of the armies, were things able to inflame all men's courages : but above all, that of the triumph, among the Romans, was not pageants or gaudery, but one of the wisest and noblest institutions that ever was. For it contained three things ; honour to the general ; riches to the treasury out of the spoils ; and donatives to the army. But that honour, perhaps, were not fit for monarchies ; except it be in the person of the monarch himself, or his sons ; as it came to pass in the times of the Roman emperors, who did impropriate the actual triumphs to themselves and their sons, for such wars as they did achieve in person ; and left only, for wars achieved by subjects, some triumphal garments and ensigns to the general.

To conclude : no man can, by care taking, as the Scripture saith, add a cubit to his stature, in this little model of a man's body : but in the great frame of kingdoms and commonwealths, it is in the power of princes or estates, to add amplitude and greatness to their kingdoms. For by introducing such ordinances, constitutions, and customs, as we have now touched, they may sow greatness to their posterity and succession. But these things are commonly not observed, but left to take their chance.

XXX. OF REGIMENT OF HEALTH.

There is a wisdom in this beyond the rules of physic : a man's own observation, what he finds good of, and what he finds hurt of, is the best physic to preserve health. But it is a safer conclusion to say this : " This agreeth not well with me, therefore I will not continue it ; " than this, " I find no offence of this, therefore I may use it. " For strength of nature in youth passeth over many excesses, which are owing a man till his age. Discern of the coming on of years, and think not to do the same still. For age will not be defied. Beware of sudden change in any great point of diet, and if necessity enforce it, fit the rest to it.

For it is a secret both in nature and state, that it is safer to change many things than one. Examine thy customs of diet, sleep, exercise, apparel, and the like ; and try in anything thou shalt judge hurtful, to discontinue it little by little ; but so, as if thou dost find any inconvenience by the change, thou come back to it again ; for it is hard to distinguish that which is generally held good and wholesome, from that which is good particularly, and fit for thine own body. To be free-minded and cheerfully disposed, at hours of meat, and of sleep, and of exercise, is one of the best precepts of long lasting. As for the passions and studies of the mind, avoid envy, anxious fears, anger, fretting inwards, subtle and knotty inquisitions, joys, and exhilarations in excess, sadness not communicated. Entertain hopes, mirth rather than joy, variety of delights rather than surfeit of them ; wonder and admiration, and therefore novelties ; studies that fill the mind with splendid and illustrious objects, as histories, fables, and contemplations of nature. If you fly physic in health altogether, it will be too strange for your body when you shall need it. If you make it too familiar, it will work no extraordinary effect when sickness cometh. I commend rather some diet for certain seasons, than frequent use of physic, except it be grown into a custom. For those diets alter the body more, and trouble it less. Despise no new accident in your body, but ask opinion of it. In sickness respect health principally : and in health, action. For those that put their bodies to endure in health, may in most sicknesses, which are not very sharp, be cured only with diet and tendering. Celsus could never have spoken it as a physician, had he not been a wise man withal ; when he giveth it for one of the great precepts of health and lasting, that a man do vary and interchange contraries ; but with an inclination to the more benign extreme. Use fasting and full eating, but rather full eating ; watching and sleep, but rather sleep ; sitting and exercise, but rather exercise, and the like. So shall nature be cherished, and yet taught masteries. Physicians are some of them so pleasing and conformable to the humour of the patient, as they press not the true cure of the disease ; and some other are so regular in proceeding according to art for the disease, as they respect not sufficiently the condition of the patient. Take one of a middle temper : or if it may not be found in one man, combine two of either sort : and forget not to call as well the best acquainted with your body, as the best reputed of for his faculty.

XXXI. OF SUSPICION.

Suspicious amongst thoughts, are like bats amongst birds, they ever fly by twilight. Certainly they are to be repressed, or at the least well guarded : for they cloud the mind, they lose friends, and they check with business, whereby business cannot go on currently and constantly. They dispose kings to tyranny, husbands to jealousy, wise men to irresolution and melancholy. They are defects not in the heart, but in the brain : for they take place in the stoutest natures ; as in the example of Henry the Seventh of England ; there was not a

more suspicious man, nor a more stout. And in such a composition they do small hurt. For commonly they are not admitted but with examination, whether they be likely or no? But in fearful natures they gain ground too fast. There is nothing makes a man suspect much, more than to know little : and therefore men should remedy suspicion, by procuring to know more, and not to keep their suspicions in smother. What would men have? Do they think those they employ and deal with are saints? Do they not think they will have their own ends, and be truer to themselves than to them? Therefore there is no better way to moderate suspicions, than to account upon such suspicions as true, and yet to bridle them as false: for so far a man ought to make use of suspicions, as to provide, as if that should be true that he suspects, yet it may do him no hurt. Suspicions that the mind of itself gathers are but buzzes : but suspicions that are artificially nourished, and put into men's heads by the tales and whisperings of others, have stings. Certainly the best mean to clear the way in this same wood of suspicions, is frankly to communicate them with the party that he suspects ; for thereby he shall be sure to know more of the truth of them than he did before ; and withal shall make that party more circumspect not to give farther cause of suspicion. But this would not be done to men of base natures : for they, if they find themselves once suspected, will never be true. The Italian says, "*Sospetto licentia fede ;*" as if suspicion did give a passport to faith ; but it ought rather to kindle it to discharge itself.

XXXII. OF DISCOURSE.

Some in their discourse desire rather commendation of wit, in being able to hold all arguments, than of judgment in discerning what is true ; as if it were a praise to know what might be said, and not what should be thought. Some have certain common-places and themes, wherein they are good, and want variety : which kind of poverty is for the most part tedious, and, when it is once perceived, ridiculous. The honourablest part of talk is to give the occasion ; and again to moderate, and pass to somewhat else ; for then a man leads the dance. It is good in discourse and speech of conversation to vary and intermingle speech of the present occasion with arguments : tales with reasons ; asking of questions with telling of opinions ; and jest with earnest ; for it is a dull thing to tire, and, as we say now, to jade anything too far. As for jest, there be certain things which ought to be privileged from it ; namely, religion, matters of state, great persons, any man's present business of importance, and any case that deserveth pity. Yet there be some that think their wits have been asleep, except they dart out somewhat that is piquant, and to the quick : that is a vein which would be bridled ;

Parce, puer, stimulis, et fortius uterè loris.

And generally men ought to find the difference between saltness and bitterness. Certainly he that hath a satirical vein, as he maketh

others afraid of his wit, so he had need be afraid of others' memory. He that questioneth much shall learn much, and content much ; but especially if he apply his questions to the skill of the persons whom he asketh ; for he shall give them occasion to please themselves in speaking, and himself shall continually gather knowledge. But let his questions not be troublesome, for that is fit for a poser. And let him be sure to leave other men their turns to speak. Nay, if there be any that would reign, and take up all the time, let him find means to take them off, and bring others on ; as musicians use to do with those that dance too long galliards. If you dissemble sometimes your knowledge of that you are thought to know, you shall be thought another time to know that you know not. Speech of a man's self ought to be seldom and well chosen. I knew one was wont to say in scorn, "He must needs be a wise man, he speaks so much of himself:" and there is but one case wherein a man may commend himself with good grace, and that is in commending virtue in another ; especially if it be such a virtue whereunto himself pretendeth. Speech of touch towards others should be sparingly used, for discourse ought to be as a field, without coming home to any man. I knew two noblemen of the west part of England, whereof the one was given to scoff, but kept ever royal cheer in his house ; the other would ask of those that had been at the other's table, "Tell truly, was there never a flout or dry blow given?" To which the guest would answer, Such and such a thing passed. The lord would say, "I thought he would mar a good dinner." Discretion of speech is more than eloquence ; and to speak agreeably to him with whom we deal, is more than to speak in good words or in good order. A good continued speech, without a good speech of interlocution, shows slowness : and a good reply, or second speech, without a good settled speech, sheweth shallowness and weakness. As we see in beasts, that those that are weakest in the course, are yet nimblest in the turn : as it is betwixt the greyhound and the hare. To use too many circumstances ere one come to the matter, is wearisome ; to use none at all, is blunt.

XXXIII. OF PLANTATIONS.

Plantations are amongst ancient, primitive, and heroical works. When the world was young, it begat more children ; but now it is old, it begets fewer : for I may justly account new plantations to be the children of former kingdoms. I like a plantation in a pure soil ; that is, where people are not displanted to the end to plant in others. For else it is rather an extirpation, than a plantation. Planting of countries is like planting of woods ; for you must make account to lose almost twenty years' profit, and expect your recompence in the end. For the principal thing that hath been the destruction of most plantations, hath been the base and hasty drawing of profit in the first years. It is true, speedy profit is not to be neglected, as far as may stand with the good of the plantation, but no farther. It is a shameful and unblessed thing, to take the scum of people ; and wicked con-

demned men, to be the people with whom you plant; and not only so, but it spoileth the plantation; for they will ever live like rogues, and not fall to work, but be lazy, and do mischief, and spend victuals, and be quickly weary, and then certify over to their country, to the discredit of the plantation. The people wherewith you plant ought to be gardeners, ploughmen, labourers, smiths, carpenters, joiners, fishermen, fowlers, with some few apothecaries, surgeons, cooks, and bakers. In a country of plantation, first look about what kind of victual the country yields of itself to hand; as chestnuts, walnuts, pine-apples, olives, dates, plums, cherries, wild honey, and the like, and make use of them. Then consider what victual or esculent things there are, which grow speedily and within the year; as parsnips, carrots, turnips, onions, radishes, artichokes of Jerusalem, maize, and the like. For wheat, barley, and oats, they ask too much labour: but with peas and beans you may begin; both because they ask less labour, and because they serve for meat as well as for bread. And of rice likewise cometh a great increase, and it is a kind of meat. Above all there ought to be brought store of biscuit, oatmeal, flour, meal, and the like, in the beginning, till bread may be had. For beasts or birds, take chiefly such as are least subject to diseases, and multiply fastest: as swine, goats, cocks, hens, turkeys, geese, house-doves, and the like. The victual in plantations ought to be expended almost as in a besieged town; that is, with certain allowance. And let the main part of the ground employed to gardens or corn be to a common stock; and to be laid in, and stored up, and then delivered out in proportion; besides some spots of ground that any particular person will manure for his own private. Consider likewise what commodities the soil where the plantation is doth naturally yield, that they may some way help to defray the charge of the plantation: so it be not as was said, to the untimely prejudice of the main business; as it hath fared with tobacco in Virginia. Wood commonly aboundeth but too much: and therefore timber is fit to be one. If there be iron ore, and streams whereupon to set the mills; iron is a brave commodity where wood aboundeth. Making of bay-salt, if the climate be proper for it, would be put in experience. Growing silk likewise, if any be, is a likely commodity. Pitch and tar, where store of firs and pines are, will not fail. So drugs and sweet woods, where they are, cannot but yield great profit. Soap-ashes, likewise, and other things that may be thought of. But moil not too much under ground; for the hope of mines is very uncertain, and useth to make the planters lazy in other things. For government, let it be in the hands of one assisted with some counsel: and let them have commission to exercise martial laws with some limitation. And above all, let men make that profit of being in the wilderness, as they have God always, and his service, before their eyes. Let not the government of the plantation depend upon too many counsellors and undertakers in the country that planteth, but upon a temperate number; and let those be rather noblemen and gentlemen, than merchants: for they look ever to the present gain. Let there be freedoms from custom, till the plantation be of strength: and not only

freedom from custom, but freedom to carry their commodities where they may make their best of them, except there be some special cause of caution. Cram not in people, by sending too fast company after company; but rather hearken how they waste; and send supplies proportionably; but so as the number may live well in the plantation, and not by surcharge be in penury. It hath been a great endangering to the health of some plantations, that they have built along the sea and rivers, in marish and unwholesome grounds. Therefore though you begin there to avoid carriage, and other like discommodities, yet build still rather upwards from the streams, than along. It concerneth likewise the health of the plantation, that they have good store of salt with them, that they may use it in their victuals when it shall be necessary. If you plant where savages are, do not only entertain them with trifles and gingles; but use them justly and graciously, with sufficient guard nevertheless; and do not win their favour by helping them to invade their enemies; but for their defence it is not amiss. And send oft of them over to the country that plants, that they may see better condition than their own, and commend it when they return. When the plantation grows to strength, than it is time to plant with women as well as men; that the plantation may spread into generations; and not be ever pieced from without. It is the sinfulness thing in the world to forsake or destitute a plantation once in forwardness: for besides the dishonour, it is the guiltiness of blood of many commiserable persons.

XXXIV. OF RICHES.

I cannot call riches better than the baggage of virtue. The Roman word is better, "*impedimenta*." For as the baggage is to an army, so are riches to virtue. It cannot be spared, nor left behind, but it hindereth the march; yea, and the care of it sometimes loseth or disturbeth the victory. Of great riches there is no real use, except it be in the distribution; the rest is but conceit. So saith Solomon, "Where much is, there are many to consume it; and what hath the owner, but the sight of it with his eyes?" The personal fruition in any man, cannot reach to feel great riches: there is a custody of them; or a power of dole and donative of them; or a fame of them; but no solid use to the owner. Do you not see what feigned prices are set upon little stones and rareties? And what works of ostentation are undertaken, because there might seem to be some use of great riches? But then you will say, they may be of use, to buy men out of dangers or troubles. As Solomon saith, "Riches are as a strong hold in the imagination of the rich man." But this is excellently expressed, that it is in imagination, and not always in fact. For certainly great riches have sold more men than they have bought out. Seek not proud riches, but such as thou mayest get justly, use soberly, distribute cheerfully, and leave contentedly. Yet have no abstract nor friarly contempt of them: but distinguish, as Cicero saith well of Rabirius Posthumus; "*in studio rei amplificandæ apparebat, non avaritiæ prædam, sed*

instrumentum bonitati quæri." Hearken also to Solomon, and beware of hasty gathering of riches : " Qui festinat ad divitias, non erit insons." The poets feign, that when Plutus, which is riches, is sent from Jupiter, he limps, and goes slowly ; but when he is sent from Pluto, he runs, and is swift of foot : meaning, that riches gotten by good means and just labour, pace slowly ; but when they come by the death of others, as by the course of inheritance, testaments, and the like, they come tumbling upon a man. But it might be applied likewise to Pluto, taking him for the devil. For when riches come from the devil, as by fraud, and oppression, and unjust means, they come upon speed. The ways to enrich are many, and most of them foul. Parsimony is one of the best, and yet is not innocent : for it withholdeth men from works of liberality and charity. The improvement of the ground is the most natural obtaining of riches ; for it is our great mother's blessing, the earth's ; but it is slow. And yet, where men of great wealth do stoop to husbandry, it multiplieth riches exceedingly. I knew a nobleman in England that had the greatest audits of any man in my time : a great grazier, a great sheep-master, a great timber-man, a great collier, a great corn-master, a great lead-man ; and so of iron, and a number of the like points of husbandry : so as the earth seemed a sea to him, in respect of the perpetual importation. It was truly observed by one, that himself came very hardly to a little riches, and very easily to great riches. For when a man's stock is come to that, that he can expect the prime of markets, and overcome those bargains, which for their greatness are few men's money, and be partner in the industries of young men, he cannot but increase mainly. The gains of ordinary trades and vocations are honest, and furthered by two things, chiefly, by diligence, and by a good name for good and fair dealing. But the gains of bargains are of a more doubtful nature, when men should wait upon other's necessity ; broke by servants and instruments to draw them on ; put off others cunningly that would be better chapmen, and the like practices, which are crafty and naught. As for the chopping of bargains, when a man buys, not to hold, but to sell over again, that commonly grindeth double, both upon the seller, and upon the buyer. Sharings do greatly enrich, if the hands be well chosen that are trusted. Usury is the certainest means of gain, though one of the worst, as that whereby a man doth eat his bread " in sudori vultus alieni ;" and besides, doth plough upon Sundays. But yet certain though it be, it hath flows ; for that the scriveners and brokers do value unsound men, to serve their own turn. The fortune in being the first in an invention, or in a privilege, doth cause sometimes a wonderful overgrowth in riches ; as it was with the first sugar-man in the Canaries. Therefore, if a man can play the true logician, to have as well judgment as invention, he may do great matters, especially if the times be fit. He that resteth upon gains certain, shall hardly grow to great riches. And he that puts all upon adventures, doth oftentimes break, and come to poverty : it is good therefore to guard adventures with certainties that may escape losses. Monopolies, and co-emption of wares for resale, where they are not restrained, are great means to

enrich ; especially if the party have intelligence what things are like to come into request, and to store himself beforehand. Riches gotten by service, though it be of the best rise, yet when they are gotten by flattery, feeding humours, and other servile conditions, they may be placed among the worst. As for fishing for testaments and executorships, as Tacitus saith of Seneca, "*Testamenta et orbos tanquam indagine capi,*" it is yet worse ; by how much men submit themselves to meaner persons than in service. Believe not much them that seem to despise riches ; for they despise them that despair of them : and none worse when they come to them. Be not penny-wise ; riches have wings, and sometimes they fly away of themselves, sometimes they must be set flying to bring in more. Men leave their riches either to their kindred, or to the public : and moderate portions prosper best in both. A great estate left to an heir, is as a lure to all the birds of prey round about, to seize on him, if he be not the better established in years and judgment. Likewise glorious gifts and foundations, are like sacrifices without salt ; and but the painted sepulchres of alms, which soon will putrefy and corrupt inwardly. Therefore measure not thine advancements by quantity, but frame them by measure : and defer not charities till death : for certainly, if a man weigh it rightly, he that doth so, is rather liberal of another man's than of his own.

XXXV. OF PROPHECIES.

I mean not to speak of divine prophecies, nor of heathen oracles, nor of natural predictions ; but only of prophecies that hath been of certain memory, and from hidden causes. Saith the Pythonissa to Saul ; "To morrow thou and thy son shall be with me." Virgil hath these verses from Homer :

At deus
Et natiatorum, et qui nascentur ab illis
Æneid. iii. 97.

A prophecy, as it seems, of the Roman empire. Seneca the Tragedian hath these verses :

Venient annis
Secula seris, quibus oceanus
Vincula rerum laxet, et ingens
Pace tibi, Tiphysque novos
Detrahet orbos ; nec sit teris
Ultima Thule :

A prophecy of the discovery of America. The daughter of Polycrates dreamed, that Jove bathed her father, and Apollo anointed him ; and it came to pass, that he was crucified in an open place, where the sun made his body run with sweat, and the rain washed it. Philip of Macedon dreamed he sealed up his wife's belly ; whereby he did expound it, that his wife should be barren ; but Aristander the sooth-sayer told him, his wife was with child : because men do not use to seal vessels that are empty. A Phantasm that appeared to M. Brutus, in his tent, said to him, "*Philippis iterum me videbis.*" Tiberius said to

Galba, "Tu quoque, Galba, degustabis imperium." In Vespasian's time there went a prophecy in the east, that those that should come forth of Judea, should reign over the world ; which though it may be was meant of our Saviour, yet Tacitus expounds it of Vespasian. Domitian dreamed, the night before he was slain, that a golden head was growing out of the nape of his neck : and indeed the succession that followed him, for many years made golden times. Henry the sixth of England said of Henry the seventh, when he was a lad, and gave him water ; "This is the lad that shall enjoy the crown for which we strive." When I was in France, I heard from one Dr. Pena, that, the queen-mother, who was given to curious arts, caused the king her husband's nativity to be calculated under a false name ; and the astrologer gave a judgment, that he should be killed in a duel ; at which the queen laughed, thinking her husband to be above challenges and duels : but he was slain, upon a course, at tilt, the splinters of the staff of Montgomery going in at his beaver. The trivial prophecy, which I heard when I was a child, and when queen Elizabeth was in the flower of her years, was ;

When Hempe is spun,
England's donne,

Whereby it was generally conceived, that after the princes had reigned, which had the principal letters of that word Hempe, which were Henry, Edward, Mary, Philip, and Elizabeth, England should come to utter confusion ; which, thanks be to God, is verified only in the change of the name, for that the king's style is now no more of England, but of Britain. There was also another prophecy before the year eighty-eight, which I do not well understand :

There shall be seen upon a day,
Between the bough and the May,
The black fleet of Norway,
When that is come and gone,
England build houses of lime and stone,
For after wars shall you have none.

It was generally conceived to be meant of the Spanish fleet that came in eighty-eight. For that the king of Spain's surname, as they say, is Norway. The prediction of Regiomontanus,

Octogesimus octavus mirabilis annus :

was thought likewise accomplished, in the sending of that great fleet, being the greatest in strength, though not in number, of all that ever swam upon the sea. As for Cleon's dream, I think it was a jest : it was, that he was devoured of a long dragon ; and it was expounded of a maker of sausages, that troubled him exceedingly. There are numbers of the like kind ; especially if you include dreams, and predictions of astrology. But I have set down these few only of certain credit, for example. My judgment is, that they ought all to be despised, and ought to serve but for winter talk by the fire-side. Though when I say despised, I mean it as for belief : for otherwise, the spreading or publishing of them, is in no sort to be despised ; for they have done

much mischief. And I see many severe laws made to suppress them. That that hath given them grace, and some credit, consisteth in three things : first, that men mark when they hit, and never mark when they miss ; as they do, generally, also of dreams. The second is, that probable conjectures, or obscure traditions, many times, turn themselves into prophecies : while the nature of man, which coveteth divination, thinks it no peril to foretel that, which indeed they do but collect ; as that of Seneca's verse. For so much was then subject to demonstration, that the globe of the earth had great parts beyond the Atlantic, which might be probably conceived not to be all sea : and adding thereto, the tradition in Plato's *Timæus*, and his *Atlanticus*, it might encourage one to turn it to a prediction. The third, and last, which is the great one, is, that almost all of them, being infinite in number, have been impostures, and by idle and crafty brains, merely contrived and feigned, after the event passed.

XXXVI. OF AMBITION.

Ambition is like choler, which is an humour that maketh men active, earnest, full of alacrity, and stirring, if it be not stopped. But if it be stopped, and cannot have its way, it becometh adust, and thereby malign and venomous. So ambitious men, if they find the way open for their rising, and still get forward, they are rather busy than dangerous ; but if they be checked in their desires, they become secretly discontent, and look upon men and matters with an evil eye, and are best pleased when things go backward ; which is the worst property in a servant of a prince or state. Therefore it is good for princes, if they use ambitious men, to handle it so, as they be still progressive, and not retrograde ; which, because it cannot be without inconvenience, it is good not to use such natures at all. For if they rise not with their service, they will take order to make their service fall with them. But since we have said it were good not to use men of ambitious natures, except it be upon necessity, it is fit we speak, in what cases they are of necessity. Good commanders in the wars must be taken, be they never so ambitious : for the use of their service dispenseth with the rest ; and to take a soldier without ambition, is to pull off his spurs. There is also great use of ambitious men, in being screens to princes, in matters of danger and envy : for no man will take that part, except he be like a seeled dove, that mounts, and mounts, because he cannot see about him. There is use also of ambitious men in pulling down the greatness of any subject that over-tops ; as Tiberius used Macro in the pulling down of Sejanus. Since therefore they must be used in such cases, there resteth to speak how they are to be bridled, that they may be less dangerous. There is less danger of them, if they be of mean birth than if they be noble ; and if they be rather harsh of nature, than gracious and popular ; and if they be rather new raised, than grown cunning and fortified in their greatness. It is counted by some a weakness in princes to have favourites ; but it is, of all others, the best remedy against ambitious great ones. For when

the way of pleasuring and displeasuring lieth by the favourite, it is impossible any other should be over-great. Another means to curb them, is to balance them by others as proud as they. But then there must be some middle counsellors to keep things steady ; for without that ballast the ship will roll too much. At the least a prince may animate and inure some meaner persons, to be as it were scourges to ambitious men. As for the having of them obnoxious to ruin, if they be of fearful natures it may do well : but if they be stout and daring, it may precipitate their designs, and prove dangerous. As for the pulling of them down, if the affairs require it, and that it may not be done with safety suddenly, the only way is, the interchange continually of favours and disgraces, whereby they may not know what to expect, and be as it were in a wood. Of ambitions, it is less harmful the ambition to prevail in great things, than that other to appear in every thing ; for that breeds confusion, and mars business : but yet it is less danger to have an ambitious man stirring in business, than great in dependencies. He that seeketh to be eminent amongst able men, hath a great task ; but that is ever good for the public. But he that plots to be the only figure amongst ciphers, is the decay of a whole age. Honour hath three things in it : the vantage ground to do good ; the approach to kings and principal persons ; and the raising of a man's own fortunes. He that hath the best of these intentions, when he aspireth, is an honest man : and that prince that can discern of these intentions in another that aspireth, is a wise prince. Generally let princes and states choose such ministers as are more sensible of duty than of rising ; and such as love business rather upon conscience, than upon bravery ; and let them discern a busy nature from a willing mind.

XXXVII. OF MASQUES AND TRIUMPHS.

These things are but toys to come amongst such serious observations. But yet, since princes will have such things, it is better they should be graced with elegance, than daubed with cost. Dancing to song, is a thing of great state and pleasure. I understand it, that the song be in quire, placed aloft, and accompanied with some broken music : and the ditty fitted to the device. Acting in song, especially in dialogues, hath an extreme good grace ; I say acting, not dancing, (for that is a mean and vulgar thing,) and the voices of the dialogue should be strong and manly, a base, and a tenor ; no treble, and the ditty high and tragical ; not nice or dainty. Several quires placed one over-against another, and taking the voice by catches, anthem-wise, give great pleasure. Turning dances into figure, is a childish curiosity. And generally let it be noted, that those things which I here set down, are such as do naturally take the sense, and not respect petty wonderments. It is true, the alterations of scenes, so it be quietly and without noise, are things of great beauty and pleasure ; for they feed and relieve the eye before it be full of the same object. Let the scenes abound with light, specially coloured and varied : and let the maskers, or any

other that are to come down from the scene, have some motions upon the scene itself before their coming down ; for it draws the eye strangely, and makes it with great pleasure to desire to see that it cannot perfectly discern. Let the songs be loud and cheerful, and not chirpings or pulings. Let the music likewise be sharp and loud, and well placed. The colours that show best by candle-light, are white, carnation, and a kind of sea-water green ; and ouches, or spangs, as they are of no great cost, so are they of most glory. As for rich embroidery, it is lost, and not discerned. Let the suits of the maskers be graceful, and such as become the person when the vizards are off : not after examples of known attires ; Turks, soldiers, mariners, and the like. Let anti-masks not be long ; they have been commonly of fools, satyrs, baboons, wild men, antics, beasts, spirits, witches, Ethiopes, pigmies, turquets, nymphs, rustics, Cupids, statues moving, and the like. As for angels, it is not comical enough to put them in anti-masks ; and anything that is hideous, as devils, giants, is on the other side as unfit : but chiefly, let the music of them be recreative, and with some strange changes. Some sweet odours suddenly coming forth without any drops falling, are in such a company, as there is steam and heat, things of great pleasure and refreshment. Double masques, one of men, another of ladies, addeth state and variety. But all is nothing except the room be kept clear and neat.

For jousts, and tourneys, and barriers, the glories of them are chiefly in the chariots, wherein the challengers make their entry ; especially if they be drawn with strange beasts : as lions, bears, camels, and the like : or in the devices of their entrance, or in the bravery of their liveries : or in the goodly furniture of their horses and armour. But enough of these toys.

XXXVIII. OF NATURE IN MEN.

Nature is often hidden, sometimes overcome, seldom extinguished. Force maketh nature more violent in the return ; doctrine and discourse maketh nature less importune : but custom only doth alter and subdue nature. He that seeketh victory over his nature, let him not set himself too great, nor too small tasks ; for the first will make him dejected by often failings ; and the second will make him a small proceeder, though by often prevailings. And at the first, let him practice with helps, as swimmers do with bladders or rushes : but after a time, let him practise with disadvantages, as dancers do with thick shoes. For it breeds great perfection, if the practice be harder than the use. Where nature is mighty, and therefore the victory hard, the degrees had need be, first to stay and arrest nature in time ; like to him that would say over the four and twenty letters when he was angry : then to go less in quantity ; as if one should, in forbearing wine, come from drinking healths, to a draught at a meal ; and lastly, to discontinue altogether. But if a man have the fortitude and resolution to enfranchise himself at once, that is the best :

*Optimus ille animi vindex, lædencia pectus
Vincula qui rupit, dedoluitque semel.*

Neither is the ancient rule amiss, to bend nature as a wand to a contrary extreme, whereby to set it right : understanding it where the contrary extreme is no vice. Let not a man force a habit upon himself with a perpetual continuance, but with some intermission. For both the pause reinforceth the new onset ; and if a man that is not perfect be ever in practice, he shall as well practise his errors as his abilities, and induce one habit of both ; and there is no means to help this but by seasonable intermissions. But let not a man trust his victory over his nature too far ; for nature will lie buried a great time, and yet revive upon the occasion or temptation. Like as it was with *Æsop's* damsel, turned from a cat to a woman, who sat very demurely at the board's end, till a mouse ran before her. Therefore let a man either avoid the occasion altogether, or put himself often to it, that he may be little moved with it. A man's nature is best perceived in privateness, for there is no affectation ; in passion, for that putteth a man out of his precepts ; and in a new case or experiment, for there custom leaveth him. They are happy men, whose natures sort with their vocations ; otherwise they may say, "*Multum incola fuit anima mea :*" when they converse in those things they do not affect. In studies, whatsoever a man commandeth upon himself, let him set hours for it ; but whatsoever is agreeable to his nature, let him take no care for any set times ; for his thoughts will fly to it of themselves, so as the spaces of other business or studies will suffice. A man's nature runs either to herbs, or weeds : therefore let him seasonably water the one, and destroy the other.

XXXIX. OF CUSTOM AND EDUCATION.

Men's thoughts are much according to their inclination ; their discourse and speeches according to their learning and infused opinions ; but their deeds are after as they have been accustomed. And therefore, as *Machiavel* well noteth, though in an evil-favoured instance, there is no trusting to the force of nature, nor to the bravery of words, except it be corroborate by custom. His instance is, that for the achieving of a desperate conspiracy a man should not rest upon the fierceness of any man's nature, or his resolute undertakings ; but take such an one as hath had his hands formerly in blood. But *Machiavel* knew not of a friar *Clement*, nor a *Ravillac*, nor a *Jaureguy*, nor a *Baltazar Gerard* : yet his rule holdeth still, that nature, nor the engagement of words, are not so forcible as custom. Only superstition is now so well advanced, that men of the first blood are as firm as butchers by occupation : and votary resolution is made equipollent to custom, even in matter of blood. In other things, the predominancy of custom is everywhere visible ; inasmuch as a man would wonder to hear men profess, protest, engage, give great words, and then do just as they have done before : as if they were dead images, and engines moved only by the wheels of custom. We see also the reign or tyranny of custom what it is. The *Indians*, I mean the sect of their wise men, lay themselves quietly upon a stack of

wood, and so sacrifice themselves by fire. Nay, the wives strive to be burned with the corps of their husbands. The lads of Sparta, of ancient time, were wont to be scourged upon the altar of Diana, without so much as queching. I remember in the beginning of queen Elizabeth's time of England, an Irish rebel condemned put up a petition to the deputy that he might be hanged in a with, and not in an halter, because it had been so used with former rebels. There be monks in Russia, for penance, that will sit a whole night in a vessel of water, till they be engaged with hard ice. Many examples may be put of the force of custom, both upon mind and body. Therefore, since custom is the principal magistrate of man's life, let men by all means endeavour to obtain good customs. Certainly custom is most perfect, when it beginneth in young years: this we call education, which is, in effect, but an early custom. So we see in languages, the tongue is more pliant to all expressions and sounds, the joints are more supple to all feats of activity and motions, in youth than afterwards. For it is true, that late learners cannot so well take the ply, except it be in some minds that have not suffered themselves to fix, but have kept themselves open and prepared to receive continual amendment, which is exceeding rare. But if the force of custom simple and separate be great, the force of custom copulate and conjoined, and collegiate, is far greater. For there example teacheth, company comforteth, emulation quickeneth, glory raiseth: so as in such places the force of custom is in its exaltation. Certainly the great multiplication of virtues upon human nature resteth upon societies well ordained and disciplined. For common-wealths and good governments do nourish virtue grown, but do not much mend the seeds. But the misery is, that the most effectual means are now applied to the ends least to be desired.

XL. OF FORTUNE.

It cannot be denied but outward accidents conduce much to fortune: favour, opportunity, death of others, occasion fitting virtue. But chiefly, the mold of a man's fortune is in his own hands. "Faber quisque fortunæ suæ," saith the poet. And the most frequent of external causes is, that the folly of one man is the fortune of another. For no man prospers so suddenly as by others' errors. "Serpens nisi serpentem comederit non fit draco." Overt and apparent virtues bring forth praise; but there be secret and hidden virtues that bring forth fortune; certain deliveries of a man's self, which have no name. The Spanish name, *desemboltura*, partly expresseth them: when there be not stonds, nor restiveness in a man's nature; but that the wheels of his mind keep way with the wheels of his fortune. For so Livy, after he had described Cato Major in these words: "in illo viro, tantum robur corporis et animi fuit, ut quocunque loco natus esset, fortunam sibi facturum videretur;" falleth upon that, that he had *versatile ingenium*. Therefore, if a man look sharply and attentively, he shall see fortune: for though she be blind, yet she is not invisible. The way of fortune is like the milky way in the sky; which is a meeting or knot

of a number of small stars, not seen asunder, but giving light together. So are there a number of little and scarce discerned virtues, or rather faculties and customs, that make men fortunate. The Italians note some of them, such as a man would little think. When they speak of one that cannot do amiss, they will throw into his other conditions, that he hath "*Poco di matto*." And certainly there be not two more fortunate properties, than to have a little of the fool, and not too much of the honest. Therefore extreme lovers of their country, or masters, were never fortunate, neither can they be. For when a man placeth his thoughts without himself, he goeth not his own way. An hasty fortune maketh an enterprizer and remover; the French hath it better, *entreprenant*, or *renuant*, but the exercised fortune maketh the able man. Fortune is to be honoured and respected, and it be but for our daughters, Confidence and Reputation. For these two felicity breedeth: the first within a man's self; the latter in others towards him. All wise men, to decline the envy of their own virtues, use to ascribe them to Providence and fortune; for so they may the better assume them: and besides, it is greatness in a man to be the care of the higher powers. So Cæsar said to the pilot in the tempest, "*Cæsarem portas, et fortunam ejus*." So Sylla chose the name of *felix*, and not of *magnus*: and it hath been noted, that those that ascribe openly too much to their own wisdom and policy, end unfortunate. It is written, that Timotheus the Athenian, after he had, in the account he gave to the state of his government, often interlaced this speech, "And in this fortune had no part;" never prospered in anything he undertook afterwards. Certainly there be, whose fortunes are like Homer's verses, that have a slide and easiness more than the verses of other poets: as Plutarch saith of Timoleon's fortune, in respect of that of Agesilaus or Epaminondas. And that this should be, no doubt it is much in a man's self.

XII. OF USURY.

Many have made witty invectives against usury. They say that it is pity the devil should have God's part, which is the tithe. That the usurer is the greatest sabbath-breaker, because his plough goeth every Sunday. That the usurer is the drone that Virgil speaketh of:

Ignavum fucos pecus a præsepibus arcens.

That the usurer breaketh the first law that was made for mankind after the fall; which was, "*In sudore vultus tui comedes panem tuum*:" not, "*In sudore vultus alieni*." That usurers should have orange-tawney bonnets, because they do judaize. That it is against nature, for money to beget money: and the like. I say this only, that usury is a "*concessum propter duritiem cordis*:" for since there must be borrowing and lending, and men are so hard of heart as they will not lend freely, usury must be permitted. Some others have made suspicious and cunning propositions of banks, discovery of men's estates, and other inventions. But few have spoken of usury usefully. It is good to set before us the incommodities and commodities of usury

that the good may be either weighed out, or culled out ; and warily to provide, that while we make forth to that which is better, we meet not with that which is worse.

The discommodities of usury are : first, that it makes fewer merchants. For were it not for this lazy trade of usury, money would not lie still, but would in great part be employed upon merchandizing ; which is the *vena porta* of wealth in a state. The second, that it makes poor merchants. For as a farmer cannot husband his ground so well, if he sit at a great rent ; so the merchant cannot drive his trade so well, if he sit at great usury. The third is incident to the other two ; and that is, the decay of customs of kings or states, which ebb or flow with merchandizing. The fourth, that it bringeth the treasure of a realm of state into a few hands. For the usurer being at certainties, and others at uncertainties, at the end of the game most of the money will be in the box ; and ever a state flourisheth when wealth is more equally spread. The fifth, that it beats down the price of land : for the employment of money is chiefly either merchandizing or purchasing ; and usury way-lays both. The sixth, that it doth dull and damp all industries, improvements, and new inventions, wherein money would be stirring, if it were not for this slug. The last, that it is the canker and ruin of many men's estates, which in process of time breeds a public poverty.

On the other side, the commodities of usury are : first, that howsoever usury in some respect hindereth merchandizing, yet in some other it advanceth it ; for it is certain that the greatest part of trade is driven by young merchants, upon borrowing at interest ; so as if the usurer either call in or keep back his money, there will ensue presently a great stand of trade. The second is, that were it not for this easy borrowing upon interest, men's necessities would draw upon them a most sudden undoing ; in that they would be forced to sell their means, be it lands or goods, far under foot ; and so whereas usury doth but gnaw upon them, bad markets would swallow them quite up. As for mortgaging or pawning, it will little mend the matter : for either men will not take pawns without use ; or if they do, they will look precisely for the forfeiture. I remember a cruel moneyed man in the country, that would say, "The devil take this usury, it keeps us from forfeitures of mortgages and bonds." The third and last is, that it is a vanity to conceive, that there would be ordinary borrowing without profit ; and it is impossible to conceive the number of inconveniences that will ensue, if borrowing be cramped. Therefore to speak of the abolishing of usury is idle. All states have ever had it in one kind or rate, or other. So as that opinion must be sent to Utopia.

To speak now of the reformation and reglement of usury : how the discommodities of it may be best avoided, and the commodities retained : it appears by the balance of commodities and discommodities of usury, two things are to be reconciled. The one, that the tooth of usury be grinded that it bite not too much : the other, that there be left open a means to invite moneyed men to lend to the

merchants, for the continuing and quickening of trade. This cannot be done, except you introduce two several sorts of usury, a less and a greater. For if you reduce usury to one low rate, it will ease the common borrower, but the merchant will be to seek for money. And it is to be noted, that the trade of merchandize being the most lucrative, may bear usury at a good rate ; other contracts not so.

To serve both intentions, the way would be briefly thus. That there be two rates of usury : the one free and general for all ; the other under license only to certain persons, and in certain places of merchandizing. First therefore let usury in general be reduced to five in the hundred ; and let that rate be proclaimed to be free and current, and let the state shut itself out to take any penalty for the same. This will preserve borrowing from any general stop or dryness. This will ease infinite borrowers in the country. This will in good part raise the price of land, because land purchased at sixteen years' purchase will yield six in the hundred and somewhat more, whereas this rate of interest yields but five. This by like reason will encourage and edge industrious and profitable improvements ; because many will rather venture in that kind, than take five in the hundred, especially having been used to greater profit. Secondly, let there be certain persons licensed to lend to known merchants, upon usury at a higher rate : and let it be with the cautions following. Let the rate be, even with the merchant himself, somewhat more easy than that he used formerly to pay : for by that means all borrowers shall have some ease by this reformation, be he merchant or whosoever. Let it be no bank, or common stock, but every man be master of his own money. Not that I altogether mislike banks, but they will hardly be brooked in regard of certain suspicions. Let the state be answered some small matter for the licence, and the rest left to the lender ; for if the abatement be but small, it will no whit discourage the lender. For he, for example, that took before ten or nine in the hundred, will sooner descend to eight in the hundred, than give over his trade of usury ; and go from certain gains, to gains of hazard. Let these licensed lenders be in number indefinite, but restrained to certain principal cities and towns of merchandizing : for then they will be hardly able to colour other men's moneys in the country ; so as the licence of nine will not suck away the current rate of five : for no man will send his moneys far off, nor put them into unknown hands.

If it be objected, that this doth in a sort authorize usury, which before was in some places but permissive : the answer is, that it is better to mitigate usury by declaration, than to suffer it to rage by connivance.

XLII. OF YOUTH AND AGE.

A man that is young in years, may be old in hours, if he have lost no time. But that happeneth rarely. Generally youth is like the first cogitations, not so wise as the second. For there is a youth in thoughts, as well as in ages. And yet the invention of young men is

more lively than that of old ; and imaginations stream into their minds better, and as it were more divinely. Natures that have much heat, and great and violent desires and perturbations, are not ripe for action, till they have passed the meridian of their years : as it was with Julius Cæsar and Septimius Severus. Of the latter of whom it is said, "*Juventutem egit erroribus, imo furoribus, plenam.*" And yet he was the ablest emperor almost of all the list. But reposed natures may do well in youth : as it is seen in Augustus Cæsar, Cosmos duke of Florence, Gaston de Foix, and others. On the other side, heat and vivacity in age is an excellent composition for business. Young men are fitter to invent than to judge ; fitter for execution than for counsel ; and fitter for new projects than for settled business. For the experience of age, in things that fall within the compass of it, directeth them ; but in new things abuseth them. The errors of young men are the ruin of business ; but the errors of aged men amount but to this, that more might have been done, or sooner. Young men, in the conduct and manage of actions, embrace more than they can hold ; stir more than they can quiet ; fly to the end, without consideration of the means and degrees ; pursue some few principles, which they have chanced upon, absurdly ; care not to innovate, which draws unknown inconveniences ; use extreme remedies at first ; and, that which doubleth all errors, will not acknowledge or retract them : like an unready horse, that will neither stop nor turn. Men of age object too much, consult too long, adventure too little, repent too soon, and seldom drive business home to the full period ; but content themselves with a mediocrity of success. Certainly it is good to compound employments of both ; for that will be good for the present, because the virtues of either age may correct the defects of both : and good for succession, that young men may be learners, while men in age are actors : and lastly, good for extern accidents, because authority followeth old men, and favour and popularity youth. But for the moral part, perhaps youth will have the pre-eminence, as age hath for the politic. A certain Rabbin upon the text, "*Your young men shall see visions, and your old men shall dream dreams ;*" inferreth, that young men are admitted nearer to God than old ; because vision is a clearer revelation than a dream. And certainly the more a man drinketh of the world, the more it intoxicateth ; and age doth profit rather in the powers of understanding, than in the virtues of the will and affections. There be some have an over-early ripeness in their years, which fadeth betimes : these are first, such as have brittle wits, the edge whereof is soon turned ; such as was Hermogenes the rhetorician, whose books are exceeding subtile, who afterwards waxed stupid. A second sort is of those that have some natural dispositions, which have better grace in youth than in age : such as is a fluent and luxuriant speech ; which becomes youth well, but not age. So Tully saith of Hortensius, "*Idem manebat, neque idem decebat.*" The third is, of such as take too high a strain at the first, and are magnanimous, more than tract of years can uphold. As was Scipio Africanus, of whom Livy saith in effect, "*Ultima primis cedebant.*"

XLIII. OF BEAUTY.

Virtue is like a rich stone, best plain set : and surely virtue is best in a body that is comely, though not of delicate features ; and that hath rather dignity of presence, than beauty of aspect. Neither is it almost seen, that very beautiful persons are otherwise of great virtue. As if nature were rather busy not to err, than in labour to produce excellency. And therefore they prove accomplished, but not of great spirit ; and study rather behaviour than virtue. But this holds not always ; for Augustus Cesar, Titus Vespasianus, Philip le Bel of France, Edward the Fourth of England, Alcibiades of Athens, Ismael the sophi of Persia, were all high and great spirits ; and yet the most beautiful men of their times. In beauty, that of favour is more than that of colour : and that of decent and gracious motion more than that of favour. That is the best part of beauty, which a picture cannot express : no, nor the first sight of the life. There is no excellent beauty, that hath not some strangeness in the proportion. A man cannot tell whether Apelles or Albert Durer were the more trifler ; whereof the one would make a personage by geometrical proportions ; the other, by taking the best parts out of divers faces, to make one excellent. Such personages, I think, would please nobody but the painter that made them. Not but I think a painter may make a better face than ever was ; but he must do it by a kind of felicity, as a musician that maketh an excellent air in music, and not by rule. A man shall see faces, that if you examine them part by part, you shall never find a good ; and yet altogether do well. If it be true, that the principal part of beauty is in decent motion, certainly, it is no marvel, though persons in years seem many times more amiable ; “*pulchrum autem pulcher* :” for no youth can be comely but by pardon, and considering the youth, as to make up the comeliness. Beauty is as summer fruits, which are easy to corrupt, and cannot last : and for the most part it makes a dissolute youth, and an age a little out of countenance ; but yet certainly again, if it light well, it maketh virtues shine, and vices blush.

XLIV. OF DEFORMITY.

Deformed persons are commonly even with nature ; for as nature hath done ill by them, so do they by nature ; being for the most part, as the Scripture saith, “void of natural affection :” and so they have their revenge of nature. Certain there is a consent between the body and the mind, and where nature erreth in the one, she ventureth in the other. “*Ubi peccat in uno, periclitatur in altero.*” But because there is in man an election touching the frame of his mind, and a necessity in the frame of his body, the stars of natural inclination are sometimes obscured by the sun of discipline and virtue : therefore it is good to consider of deformity, not as a sign which is more deceivable, but as a cause which seldom faileth of the effect. Whosoever hath anything fixed in his person that doth induce contempt, hath also a

perpetual spur in himself, to rescue and deliver himself from scorn : therefore all deformed persons are extreme bold. First, as in their own defence, as being exposed to scorn ; but in process of time, by a general habit. Also it stirreth in them industry, and especially of this kind, to watch and observe the weakness of others, that they may have somewhat to repay. Again, in their superiors it quencheth jealousy towards them, as persons that they think they may at pleasure despise ; and it layeth their competitors and emulators asleep ; as never believing they should be in possibility of advancement, till they see them in possession. So that, upon the matter, in a great wit deformity is an advantage to rising. Kings in ancient times, and at this present, in some countries, were wont to put great trust in eunuchs, because they that are envious towards all, are more obnoxious and officious towards one. But yet their trust towards them hath rather been as to good spies and good whisperers, than good magistrates and officers. And much like is the reason of deformed persons. Still the ground is, they will, if they be of spirit, seek to free themselves from scorn ; which must be either by virtue or malice. And therefore let it not be marvelled, if sometimes they prove excellent persons ; as was Agesilaus, Zanger the son of Solyman, Æsop, Gasca president of Peru ; and Socrates may go likewise amongst them, with others.

XLV. OF BUILDING.

Houses are built to live in, and not to look on ; therefore let use be preferred before uniformity, except where both may be had. Leave the goodly fabrics of houses for beauty only, to the enchanted palaces of the poets : who build them with small cost. He that builds a fair house upon an ill seat, committeth himself to prison. Neither do I reckon it an ill seat only, where the air is unwholesome, but likewise where the air is unequal ; as you shall see many fine seats, set upon a knap of ground, environed with higher hills round about it, whereby the heat of the sun is pent in, and the wind gathereth as in troughs ; so as you shall have, and that suddenly, as great diversity of heat and cold, as if you dwelt in several places. Neither is it ill air only that maketh an ill seat ; but ill ways, ill markets ; and, if you will consult with Momus, ill neighbours. I speak not of many more ; want of water, want of wood, shade, and shelter ; want of fruitfulness, and mixture of grounds of several natures ; want of prospect ; want of level grounds ; want of places at some near distance for sports of hunting, hawking, and races ; too near the sea, too remote ; having the commodity of navigable rivers, or the discommodity of their overflowing ; too far off from great cities, which may hinder business ; or too near them, which lurcheth all provisions, and maketh everything dear ; where a man hath a great living laid together, and where he is scant ; all which, as it is impossible perhaps to find together, so it is good to know them, and think of them, that a man may take as many as he can : and if he have several dwellings, that he sort them so, that what he wanteth in the one, he may find in the other. Lucullus answered

Pompey well, when he saw his stately galleries and rooms, so large and lightsome in one of his houses, said, "Surely an excellent place for summer, but how do you do in winter?" Lucullus answered, "Why, do you not think me as wise as some fowls are, that ever change their abode towards the winter?"

To pass from the seat to the house itself, we will do as Cicero doth in the orator's art, who writes books "*De Oratore*," and a book he entitles "*Orator*:" whereof the former delivers the precepts of the art, and the latter the perfection. We will therefore describe a princely palace, making a brief model thereof. For it is strange to see, now in Europe, such huge buildings as the Vatican, and Escorial, and some others be, and yet scarce a very fair room in them.

First, therefore, I say, you cannot have a perfect palace, except you have two several sides; a side for the banquet, as is spoken of in the book of Esther; and a side for the household: the one for feasts and triumphs, the other for dwelling. I understand both these sides to be not only returns, but parts of the front; and to be uniform without, though severally partitioned within; and to be on both sides of a great and stately tower, in the midst of the front; that as it were joineth them together on either hand. I would have on the one side of the banquet, in front, one only goodly room above stairs, of some forty foot high; and under it a room for a dressing or preparing place, at times of triumphs. On the other side, which is the household side, I wish it divided at the first into a hall and a chapel, with a partition between, both of good state and bigness; and those not to go all the length, but to have at the farther end a winter and a summer parlour, both fair: and under these rooms a fair and large cellar sunk under ground; and likewise some privy kitchens, with butteries and pantries, and the like. As for the tower, I would have it two stories, of eighteen foot high apiece, above the two wings; and goodly leads upon the top, railed, with statues interposed; and the same tower to be divided into rooms, as shall be thought fit. The stairs likewise to the upper rooms, let them be upon a fair open newel, and finely railed in, with images of wood cast into a brass colour; and a very fair landing-place at the top. But this to be, if you do not appoint any of the lower rooms for a dining-place of servants; for otherwise you shall have the servants' dinner after your own: for the steam of it will come up as in a tunnel. And so much for the front. Only I understand the height of the first stairs to be sixteen foot, which is the height of the lower room.

Beyond this front is there to be a fair court, but three sides of it of a far lower building than the front. And in all the four corners of that court, fair staircases cast into turrets on the outside, and not within the row of buildings themselves: but those towers are not to be of the height of the front, but rather proportionable to the lower building. Let the court not be paved, for that striketh up a great heat in summer, and much cold in winter; but only some side alleys, with a cross, and the quarters to graze, being kept shorn, but not too near shorn. The row of return on the banquet side, let it be all stately

galleries ; in which galleries let there be three, or five fine cupolas in the length of it, placed at equal distance ; and fine coloured windows of several works. On the household side, chambers of presence and ordinary entertainments, with some bed-chambers ; and let all three sides be a double house, without thorough lights on the sides, that you may have rooms from the sun, both for forenoon and afternoon. Cast it also, that you may have rooms both for summer and winter ; shady for summer, and warm for winter. You shall have sometimes fair houses so full of glass, that one cannot tell where to become to be out of the sun or cold. For imbowed windows, I hold, them of good use (in cities, indeed, upright do better, in respect of the uniformity towards the street), for they be pretty retiring places for conference ; and besides, they keep both the wind and sun off ; for that which would strike almost through the room doth scarce pass the window. But let them be but few, four in the court, on the sides only.

Beyond this court, let there be an inward court, of the same square and height, which is to be environed with the garden on all sides : and in the inside, cloistered on all sides upon decent and beautiful arches, as high as the first story : on the under story, towards the garden, let it be turned to a grotto, or place of shade or estivation ; and only have opening and windows towards the garden, and be level upon the floor, no whit sunk under ground, to avoid all dampishness. And let there be a fountain, or some fair work of statues, in the midst of this court, and to be paved as the other court was. These buildings to be for privy lodgings on both sides, and the end for privy galleries : whereof you must foresee, that one of them be for an infirmary, if the prince or any special person should be sick, with chambers, bed-chamber antechamber and recamera joining to it. This upon the second story. Upon the ground-story, a fair gallery, open, upon pillars ; and upon the third story, likewise, an open gallery, upon pillars, to take the prospect and freshness of the garden. At both corners of the farther side, by way of return, let there be two delicate or rich cabinets, daintily paved, richly hanged, glazed with crystalline glass, and a rich cupola in the midst, and all other elegancy that may be thought upon. In the upper gallery, too, I wish that there may be, if the place will yield it, some fountains running in divers places from the wall, with some fine avoidances. And thus much for the model of the palace, save that you must have, before you come to the front, three courts : a green court plain, with a wall about : a second court of the same, but more garnished, with little turrets, or rather embellishments upon the wall ; and a third court, to make a square with the front, but not to be built, nor yet inclosed with a naked wall, but inclosed with terraces, leaded aloft, and fairly garnished on the three sides ; and cloistered on the inside with pillars, and not with arches below. As for offices, let them stand at distance, with some low galleries to pass from them to the palace itself.

XLVI. OF GARDENS.

God Almighty first planted a garden : and indeed it is the purest of human pleasures. It is the greatest refreshment of the spirits of man ; without which, buildings and palaces are but gross handyworks : and a man shall ever see, that when ages grow to civility and elegance, men come to build stately, sooner than to garden finely, as if gardening were the greater perfection. I do hold it, in the royal ordering of gardens, there ought to be gardens for all the months in the year : in which, severally, things of beauty may be then in season. For December and January, and the latter part of November, you must take such things as are green all winter ; holly, ivy, bays, juniper, cypress-trees, yew, pine-apple trees, fir trees, rosemary, lavender, periwinkle (the white, the purple, and the blue), germander, flags, orange trees, lemon trees, and myrtles, if they be stoved, and sweet marjoram, warm set. There followeth, for the latter part of January and February, the mezerion tree, which then blossoms ; crocus vernus, both the yellow and the gray ; primroses, anemonies, the early tulip, hyacinthus orientalis, chamæris, fritellaria. For March there come violets, especially the single blue, which are the earliest ; the yellow daffodil, the daisy, the almond tree in blossom, the peach tree in blossom, the cornelian tree in blossom, sweet briar. In April follow the double white violet, the wallflower, the stock-gilliflower, the cowslip, flower-de-luces, and lilies of all natures, rosemary-flowers, the tulip, the double piony, the pale daffodil, the French honeysuckle, the cherry tree in blossom, the damascene and plum trees in blossom, the white-thorn in leaf, the lilach-tree. In May and June come pinks of all sorts, especially the blush pink ; roses of all kinds, except the musk, which comes later. honeysuckles, strawberries, bugloss, columbine, the French marygold, flos Africanus, cherry-tree in fruit, ribes, figs in fruit, rasps, vine-flowers, lavender in flowers, the sweet satyrian, with the white flower ; herba muscaria, lilium convalium, the apple tree in blossom. In July come gilliflowers of all varieties, musk roses, the lime tree in blossom, early pears and plums in fruit, gennittings, codlins. In August come plums of all sorts in fruit, pears, apricots, berberies, filberds, musk melons, monks-hoods, of all colours. In September come grapes, apples, poppies of all colours, peaches, melo-cotones, nectarines, cornelians, wardens, quinces. In October, and the beginning of November, come services, medlars, bullaces, roses cut or removed to come late, hollyoaks, and such like. These particulars are for the climate of London : but my meaning is perceived, that you may have *ver perpetuum*, as the place affords.

And because the breath of flowers is far sweeter in the air, where it comes and goes, like the warbling of music, than in the hand, therefore nothing is more fit for that delight, than to know what be the flowers and plants that do best perfume the air. Roses, damask and red, are fast flowers of their smells ; so that you may walk by a whole row of them, and find nothing of their sweetness : yea, though it be in a

morning's dew. Bays likewise yield no smell as they grow; rosemary little; nor sweet marjoram. That which above all others yields the sweetest smell in the air, is the violet; especially the white double violet, which comes twice a year, about the middle of April, and about Bartholomew-tide. Next to that is the musk rose; then the strawberry leaves dying, with a most excellent cordial smell; then the flower of the vines—it is a little dust, like the dust of a bent, which grows upon the cluster, in the first coming forth; then sweet-brier; then wallflowers, which are very delightful, to be set under a parlour, or lower chamber window; then pinks and gilliflowers, especially the matted pink and clove-gilliflower; then the flowers of the lime tree; then the honeysuckles, so they be somewhat afar off. Of bean-flowers I speak not, because they are field flowers; but those which perfume the air most delightfully, not passed by as the rest, but being trodden upon and crushed, are three; that is, burnet, wild thyme, and water mints. Therefore you are to set whole alleys of them, to have the pleasure when you walk or tread.

For gardens, speaking of those which are indeed prince-like, as we have done of buildings, the contents ought not well to be under thirty acres of ground, and to be divided into three parts: a green in the entrance; a heath or desert in the going forth; and the main garden in the midst; besides alleys on both sides. And I like well, that four acres of ground be assigned to the green, six to the heath, four and four to either side, and twelve to the main garden. The green hath two pleasures; the one, because nothing is more pleasant to the eye than green grass kept finely shorn; the other, because it will give you a fair alley in the midst; by which you may go in front upon a stately hedge, which is to inclose the garden. But because the alley will be long, and in great heat of the year or day, you ought not to buy the shade in the garden by going in the sun through the green; therefore you are, of either side the green, to plant a covert alley, upon carpenter's work, about twelve foot in height, by which you may go in shade into the garden. As for the making of knots or figures, with divers coloured earths, that they may lie under the windows of the house, on that side which the garden stands, they be but toys; you may see as good sights, many times, in tarts. The garden is best to be square, encompassed on all the four sides with a stately arched hedge: the arches to be upon pillars of carpenter's work, of some ten foot high, and six foot broad; and the spaces between of the same dimension with the breadth of the arch. Over the arches let there be an entire hedge, of some four foot high, framed also upon carpenter's work; and upon the upper hedge, over every arch, a little turret, with a belly enough to receive a cage of birds; and over every space between the arches, some other little figure, with broad plates of round coloured glass, gilt, for the sun to play upon. But this hedge I intend to be raised upon a bank, not steep, but gently slope, of some six foot, set all with flowers. Also I understand, that this square of the garden should not be the whole breadth of the ground, but to leave on either side ground enough for diversity of side alleys; unto which the two

covert alleys of the green may deliver you ; but there must be no alleys with hedges at either end of this great inclosure ; not at the hither end, for letting your prospect upon the fair hedge from the green ; nor at the further end, for letting your prospect from the hedge, through the arches, upon the heath.

For the ordering of the ground within the great hedge, I leave it to variety or device ; advising nevertheless, that whatsoever form you cast it into, first it be not too busy, or full of work ; wherein I, for my part, do not like images cut out in juniper or other garden stuff ; they be for children. Little low hedges round, like welts, with some pretty pyramids, I like well ; and in some places, fair columns upon frames of carpenter's work. I would also have the alleys spacious and fair. You may have closer alleys upon the side grounds, but none in the main garden. I wish also, in the very middle, a fair mount, with three ascents and alleys, enough for four to walk a-breast ; which I would have to be perfect circles, without any bulwarks or embossments ; and the whole amount to be thirty foot high ; and some fine banqueting house, with some chimneys neatly cast, and without too much glass.

For fountains, they are a great beauty and refreshment ; but pools mar all, and make the garden unwholesome, and full of flies and frogs. Fountains I intend to be of two natures : the one that sprinkleth or spouteth water ; the other a fair receipt of water, of some thirty or forty foot square, but without fish, or slime, or mud. For the first, the ornaments of images gilt, or of marble, which are in use, do well : but the main matter is so to convey the water, as it never stay either in the bowls, or in the cistern ; that the water be never by rest discoloured, green or red, or the like ; or gather any mossiness or putrefaction. Besides that, it is to be cleansed every day by the hand. Also some steps up to it, and some fine pavement about it doth well. As for the other kind of fountain, which we may call a bathing pool, it may admit much curiosity and beauty, wherewith we will not trouble ourselves ; as, that the bottom be finely paved, and with images ; the sides likewise ; and withal embellished with coloured glass, and such things of lustre ; encompassed also with fine rails of low statues. But the main point is the same which we mentioned in the former kind of fountain ; which is, that the water be in perpetual motion, fed by a water higher than the pool, and delivered into it by fair spouts, and then discharged away under ground by some equality of bores, that it stay little. And for fine devices of arching water without spilling, and making it rise in several forms, of feathers, drinking glasses, canopies, and the like, they be pretty things to look on, but nothing to health and sweetness.

For the heath, which was the third part of our plot, I wish it to be framed as much as may be to a natural wildness. Trees I would have none in it, but some thickets made only of sweet-brier and honeysuckle, and some wild vine amongst ; and the ground set with violets, strawberries, and primroses. For these are sweet and prosper in the shade. And these to be in the heath here and there, not in any order.

I like also little heaps, in the nature of mole-hills, such as are in wild heaths, to be set, some with wild thyme, some with pinks, some with germander, that gives a good flower to the eye, some with periwinkle, some with violets, some with strawberries, some with cowslips, some with daisies, some with red roses, some with liliun convallium, some with sweet-williams red, some with bears-foot, and the like low flowers, being withal sweet and sightly. Part of which heaps to be with standards of little bushes, pricked upon their top, and part without. The standards to be roses, juniper, holly, berberies, but here and there, because of the smell of their blossom, red currants, gooseberries, rosemary, bays, sweetbrier, and such like. But these standards to be kept with cutting, that they grow not out of course.

For the side grounds, you are to fill them with variety of alleys, private, to give a full shade, some of them, wheresoever the sun be. You are to frame some of them likewise for shelter, that when the wind blows sharp, you may walk as in a gallery. And those alleys must be likewise hedged at both ends, to keep out the wind; and these closer alleys must be ever finely gravelled, and no grass, because of going wet. In many of these alleys likewise, you are to set fruit trees of all sorts; as well upon the walls as in ranges. And this would be generally observed, that the borders wherein you plant your fruit trees, be fair and large, and low, and not steep; and set with fine flowers, but thin and sparingly, lest they deceive the trees. At the end of both the side grounds, I would have a mount of some pretty height, leaving the wall of the inclosure breast high, to look abroad into the fields.

For the main garden, I do not deny but there should be some fair alleys, ranged on both sides, with fruit trees, and some pretty tufts of fruit trees, and arbours with seats, set in some decent order; but these to be by no means set too thick, but to leave the main garden so as it be not close, but the air open and free. For as for shade, I would have you rest upon the alleys of the side grounds, there to walk, if you be disposed, in the heat of the year or day; but to make account, that the main garden is for the more temperate parts of the year; and in the heat of summer, for the morning and the evening, or overcast days.

For aviaries, I like them not, except they be of that largeness, as they may be turfed, and have living plants and bushes set in them; that the birds may have more scope, and natural nestling, and that no foulness appear in the floor of the aviary.

So I have made a platform of a princely garden, partly by precept, partly by drawing; not a model, but some general lines of it; and in this I have spared for no cost. But it is nothing for great princes, that for the most part, taking advice with workmen, with no less cost set their things together; and sometimes add statues, and such things, for state and magnificence, but nothing to the true pleasure of a garden.

XLVII. OF NEGOTIATING.

It is generally better to deal by speech, than by letter; and by the mediation of a third, than by a man's self. Letters are good, when a

man would draw an answer by letter back again ; or when it may serve for a man's justification, afterwards to produce his own letter ; or where it may be danger to be interrupted, or heard by pieces. To deal in person is good, when a man's face breedeth regard, as commonly with inferiors ; or in tender cases, where a man's eye upon the countenance of him with whom he speaketh, may give him a direction how far to go : and generally where a man will reserve to himself liberty, either to disavow or to expound. In choice of instruments, it is better to choose men of a plainer sort, that are like to do that that is committed to them, and to report back again faithfully the success ; than those that are cunning to contrive out of other men's business somewhat to grace themselves, and will help the matter in report, for satisfaction sake. Use also such persons as affect the business wherein they are employed, for that quickeneth much ; and such as are fit for the matter ; as bold men for expostulation, fair spoken men for persuasion, crafty men for inquiry and observation, froward and absurd men for business that doth not well bear out itself. Use also such as have been lucky, and prevailed before in things wherein you have employed them ; for that breeds confidence, and they will strive to maintain their prescription. It is better to sound a person with whom one deals, afar off, than to fall upon the point at first ; except you mean to surprise him by some short question. It is better dealing with men in appetite, than with those that are where they would be. If a man deal with another upon conditions, the start or first performance is all ; which a man cannot reasonably demand, except either the nature of the thing be such which must go before ; or else a man can persuade the other party, that he shall still need him in some other thing ; or else that he be counted the honestest man. All practice is to discover, or to work. Men discover themselves in trust, in passion, at unawares, and of necessity, when they would have somewhat done, and cannot find an apt pretext. If you would work any man, you must either know his nature and fashions, and so lead him ; or his ends, and so persuade him ; or his weakness and disadvantages, and so awe him ; or those that have interest in him, and so govern him. In dealing with cunning persons, we must ever consider their ends to interpret their speeches ; and it is good to say little to them, and that which they least look for. In all negotiations of difficulty, a man may not look to sow and reap at once ; but must prepare business, and so ripen it by degrees.

· XLVIII. OF FOLLOWERS AND FRIENDS.

Costly followers are not to be liked ; lest while a man maketh his train longer, he maketh his wings shorter. I reckon to be costly, not them alone which charge the purse, but which are wearisome and importune in suits. Ordinary followers ought to challenge no higher conditions than countenance, recommendation, and protection from wrongs. Factionous followers are worse to be liked, which follow not upon affection to him with whom they range themselves, but upon

discontentment conceived against some other : whereupon commonly ensueth that ill intelligence that we may many times see between great personages. Likewise glorious followers, who make themselves as trumpets of the commendation of those they follow, are full of inconvenience ; for they taint business through want of secrecy ; and they export honour from a man, and make him a return in envy. There is a kind of followers likewise, which are dangerous, being indeed espials ; which inquire the secrets of the house, and bear tales of them to others. Yet such men many times are in great favour ; for they are officious, and commonly exchange tales. The following by certain estates of men answerable to that which a great person himself professeth, as of soldiers to him that hath been employed in the wars, and the like, hath ever been a thing civil, and well taken even in monarchies ; so it be without too much pomp or popularity. But the most honourable kind of following, is to be followed as one that apprehendeth to advance virtue and desert in all sorts of persons. And yet where there is no eminent odds in sufficiency, it is better to take with the more passable than with the more able. And besides, to speak truth, in base times active men are of more use than virtuous. It is true, that in government, it is good to use men of one rank equally : for to countenance some extraordinarily, is to make them insolent, and the rest discontent ; because they may claim a due. But contrariwise in favour, to use men with much difference and election is good ; for it maketh the persons preferred more thankful, and the rest more officious ; because all is of favour. It is good discretion not to make too much of any man at the first ; because one cannot hold out that proportion. To be governed, as we call it, by one, is not safe ; for it shows softness, and gives a freedom to scandal and disreputation ; for those that would not censure, or speak ill of a man immediately, will talk more boldly of those that are so great with them, and thereby wound their honour. Yet to be distracted with many, is worse ; for it makes men to be of the last impression, and full of change. To take advice of some few friends is ever honourable ; for lookers-on many times see more than the gamesters ; and the vale best discovereth the hill. There is little friendship in the world, and least of all between equals, which was wont to be magnified. That that is, is between superior and inferior, whose fortunes may comprehend the one the other.

XLIX. OF SUITORS.

Many ill matters and projects are undertaken : and private suits do putrify the public good. Many good matters are undertaken with bad minds ; I mean not only corrupt minds, but crafty minds, that intend not performance. Some embrace suits, which never mean to deal effectually in them ; but if they see there may be life in the matter by some other mean, they will be content to win a thank, or take a second reward, or at least to make use in the mean time of the suitor's hopes. Some take hold of suits, only for an occasion to cross some other, or to make an information, whereof they could not otherwise have apt pre-

text ; without care what become of the suit when that turn is served : or generally, to make other men's business a kind of entertainment to bring in their own. Nay, some undertake suits, with a full purpose to let them fall ; to the end to gratify the adverse party or competitor. Surely there is in some sort a right in every suit ; either a right of equity, if it be a suit of controversy ; or a right of desert, if it be a suit of petition. If affection lead a man to favour the wrong side in justice, let him rather use his countenance to compound the matter than to carry it. If affection lead a man to favour the less worthy in desert, let him do it without depraving or disabling the better deserver. In suits which a man doth not well understand, it is good to refer them to some friend of trust and judgment, that may report whether he may deal in them with honour ; but let him choose well his referendaries, for else he may be led by the nose. Suitors are so distasted with delays and abuses, that plain dealing in denying to deal in suits at first, and reporting the success barely, and in challenging no more thanks than one hath deserved, is grown not only honourable, but also gracious. In suits of favour, the first coming ought to take little place ; so far forth consideration may be had of his trust, that if intelligence of the matter could not otherwise have been had but by him, advantage be not taken of the note, but the party left to his other means, and in some sort recompensed for his discovery. To be ignorant of the value of a suit, is simplicity ; as well as to be ignorant of the right thereof, is want of conscience. Secrecy in suits is a great mean of obtaining ; for voicing them to be in forwardness, may discourage some kind of suitors ; but doth quicken and awake others. But timing of the suit is the principal : timing, I say, not only in respect of the person that should grant it, but in respect of those which are like to cross it. Let a man, in the choice of his mean, rather choose the fittest mean than the greatest mean : and rather them that deal in certain things than those that are general. The reparation of a denial is sometimes equal to the first grant ; if a man show himself neither dejected nor discontented. "*In quum petas, ut æquum feras ;*" is a good rule, where a man hath strength of favour ; but otherwise a man were better rise in his suit ; for he that would have ventured at first to have lost the suitor, will not in the conclusion lose both the suitor and his own former favour. Nothing is thought so easy a request to a great person, as his letter ; and yet, if it be not in a good cause, it is so much out of his reputation. There are no worse instruments than these general contrivers of suits ; for they are but a kind of poison and infection to public proceedings.

L. OF STUDIES.

Studies serve for delight, for ornament, and for ability. Their chief use for delight, is in privateness and retiring ; for ornament, is in discourse ; and for ability, is in the judgment and disposition of business. For expert men can execute, and perhaps judge of particulars, one by one ; but the general counsels, and the plots and marshalling of affairs, come best from those that are learned. To

spend too much time in studies, is sloth: to use them too much for ornament, is affectation; to make judgment only by their rules, is the humour of a scholar. They perfect nature, and are perfected by experience: for natural abilities are like natural plants, that need pruning by study; and studies themselves do give forth directions too much at large, except they be bounded in by experience. Crafty men condemn studies; simple men admire them; and wise men use them: for they teach not their own use: but that is a wisdom without them, and above them, won by observation. Read not to contradict and confute; nor to believe and take for granted; nor to find talk and discourse; but to weigh and consider. Some books are to be tasted, others to be swallowed, and some few to be chewed and digested; that is, some books are to be read only in parts; others to be read, but not curiously; and some few to be read wholly, and with diligence and attention. Some books also may be read by deputy, and extracts made of them by others; but that would be only in the less important arguments, and the meaner sort of books: else distilled books are like common distilled waters, flashy things. Reading maketh a full man; conference a ready man; and writing an exact man. And therefore if a man write little, he had need have a great memory: if he confer little, he had need have a present wit; and if he read little, he had need have much cunning, to seem to know that he doth not. Historics make men wise; poets, witty; the mathematics, subtile; natural philosophy, deep; moral, grave; logic and rhetoric, able to contend: "Abeunt studia in mores." Nay, there is no stond nor impediment in the wit, but may be wrought out by fit studies; like as diseases of the body may have appropriated exercises: bowling is good for the stone and reins; shooting for the lungs and breast; gentle walking for the stomach; riding for the head; and the like. So if a man's wit be wandering, let him study the mathematics; for in demonstrations, if his wit be called away never so little, he must begin again: if his wit be not apt to distinguish or find differences, let him study the schoolmen; for they are *cymini sectores*: if he be not apt to beat over matters, and to call up one thing to prove and illustrate another, let him study the lawyers' cases: so every defect of the mind may have a special receipt.

LI. OF FACTION.

Many have an opinion not wise; that for a prince to govern his estate, or for a great person to govern his proceedings, according to the respect of factions, is a principal part of policy; whereas, contrariwise, the chiefest wisdom is, either in ordering those things which are general, and wherein men of several factions do nevertheless agree, or in dealing with correspondence to particular persons, one by one. But I say not, that the consideration of factions is to be neglected. Mean men, in their rising, must adhere; but great men, that have strength in themselves, were better to maintain themselves indifferent and neutral. Yet even in beginners, to adhere so moderately, as he be a man of the one faction, which is most passable with the other,

commonly giveth best way. The lower and weaker faction is the firmer in conjunction : and it is often seen, that a few that are stiff do tire out a greater number that are more moderate. When one of the factions is extinguished, the remaining subdivideth : as the faction between Lucullus and the rest of the nobles of the senate, which they call *optimates*, held out a while against the faction of Pompey and Cæsar : but when the senate's authority was pulled down, Cæsar and Pompey soon after brake. The faction or party of Antonius and Octavianus Cæsar, against Brutus and Cassius, held out likewise for a time : but when Brutus and Cassius were overthrown, then soon after Antonius and Octavianus brake and subdivided. These examples are of wars, but the same holdeth in private factions. And therefore those that are seconds in factions, do many times, when the faction subdivideth, prove principals : but many times also they prove cyphers and cashiered ; for many a man's strength is in opposition ; and when that faileth he groweth out of use. It is commonly seen, that men once placed, take in with the contrary faction to that by which they enter ; thinking belike that they have the first sure, and now are ready for a new purchase. The traitor in faction lightly goeth away with it : for when matters have stuck long in balancing, the winning of some one man casteth them, and he getteth all the thanks. The even carriage between two factions proceedeth not always of moderation, but of a trueness to a man's self, with end to make use of both. Certainly in Italy they hold it a little suspect in popes, when they have often in their mouth "*Padre commune*:" and take it to be a sign of one that meaneth to refer all to the greatness of his own house. Kings had need beware how they side themselves, and make themselves as of a faction or party ; for leagues within the state are ever pernicious to monarchies ; for they raise an obligation paramount to obligation of sovereignty, and make the king "*tanquam unus ex nobis*:" as was to be seen in the league of France. When factions are carried too high, and too violently, it is a sign of weakness in princes, and much to the prejudice both of their authority and business. The motions of factions under kings ought to be like the motions, as the astronomers speak, of the inferior orbs ; which may have their proper motions, but yet still are quietly carried by the higher motion of *primum mobile*.

LII. OF CEREMONIES AND RESPECTS.

He that is only real, had need have exceeding great parts of virtue: as the stone had need to be rich that is set without foil : but if a man mark it well, it is in praise and commendation of men, as it is in gettings and gains. For the proverb is true, that light gains make heavy purses : for light gains come thick, whereas great come but now and then. So it is true, that small matters win great commendation, because they are continually in use, and in note ; whereas the occasion of any great virtue cometh but on festivals: therefore it doth much add to a man's reputation, and is, as queen Isabella said, like perpetual letters commendatory, to have good forms. To attain them, it almost

sufficeth not to despise them: for so shall a man observe them in others; and let him trust himself with the rest. For if he labour too much to express them, he shall lose their grace; which is to be natural and unaffected. Some men's behaviour is like a verse, wherein every syllable is measured: how can a man comprehend great matters, that breaketh his mind too much to small observations? Not to use ceremonies at all, is to teach others not to use them again, and so diminisheth respect to himself; especially they be not to be omitted to strangers and formal natures: but the dwelling upon them and exalting them above the moon, is not only tedious, but doth diminish the faith and credit of him that speaks. And certainly there is a kind of conveying of effectual and imprinting passages, amongst compliments, which is of singular use, if a man can hit upon it. Amongst a man's peers, a man shall be sure of familiarity; and therefore it is good a little to keep state. Amongst a man's inferiors one shall be sure of reverence; and therefore it is good a little to be familiar. He that is too much in anything, so that he giveth another occasion of satiety, maketh himself cheap. To apply one's self to others is good; so it be with demonstration that a man doth it upon regard, and not upon facility. It is a good precept, generally in seconding another, yet to add somewhat of one's own; as if you will grant his opinion, let it be with some distinction; if you will follow his motion, let it be with condition; if you allow his counsel, let it be with alledging farther reason. Men had need beware how they be too perfect in compliments; for be they never so sufficient otherwise, their enviers will be sure to give them that attribute, to the disadvantage of their greater virtues. It is loss also in business to be full of respects, or to be too curious in observing times and opportunities: Solomon saith, "He that considereth the wind shall not sow; and he that looketh to the clouds shall not reap." A wise man will make more opportunities than he finds. Men's behaviour should be like their apparel; not too strait or point device, but free for exercise or motion.

LIII. OF PRAISE.

Praise is the reflexion of virtue: but it is as the glass or body which giveth the reflexion. If it be from the common people, it is commonly false and nought; and rather followeth vain persons than virtuous, for the common people understand not many excellent virtues: the lowest virtues draw praise from them: the middle virtues work in them astonishment or admiration; but of the highest virtues they have no sense or perceiving at all: but shows, and *species virtutibus similes*, serve best with them. Certainly fame is like a river, that beareth up things light and swoln, and drowns things weighty and solid: but if persons of quality and judgment concur, then it is, as the Scripture saith, "Nomen bonum instar unguenti fragrantis." It filleth all round about, and will not easily away: for the odours of ointments are more durable than those of flowers. There be so many false

points of praise, that a man may justly hold it a suspect. Some praises proceed merely of flattery ; and if he be an ordinary flatterer, he will have certain common attributes, which may serve every man ; if he be a cunning flatterer, he will follow the arch-flatterer, which is a man's self ; and wherein a man thinketh best of himself, therein the flatterer will uphold him most : but if he be an impudent flatterer, look, wherein a man is conscious to himself that he is most defective, and is most out of countenance in himself, that will the flatterer entitle him to perforce, *spretæ conscientia*. Some praises come of good wishes and respects, which is a form due in civility to kings and great persons ; *laudando præcipere* ; when by telling men what they are, they represent to them what they should be. Some men are praised maliciously to their hurt, thereby to stir envy and jealousy towards them : *pessimum genus inimicorum laudantium* ; insomuch as it was a proverb amongst the Grecians, that he that was praised to his hurt, should have a push rise upon his nose ; as we say, that a blister will rise upon one's tongue that tells a lie. Certainly moderate praise, used with opportunity, and not vulgar, is that which doth the good. Solomon saith, "He that praiseth his friend aloud, rising early, it shall be to him no better than a curse." Too much magnifying of man or matter, doth irritate contradiction, and procure envy and scorn. To praise man's self cannot be decent, except it be in rare cases : but to praise a man's office or profession, he may do it with good grace, and with a kind of magnanimity. The cardinals of Rome, which are theologues, and friars, and schoolmen, have a phrase of notable contempt and scorn, towards civil business ; for they call all temporal business, of wars, embassages, judicature, and other employments, *sbirrerie*, which is under-sheriffries, as if they were but matters for under-sheriffs and catch-polls ; though many times those under-sheriffries do more good than their high speculations. St. Paul, when he boasts of himself, he doth oft interlace, "I speak like a fool ;" but speaking of his calling, he saith, "*magnificabo apostolatium meum.*"

LIV. OF VAIN-GLORY.

It was prettily devised of Æsop : The fly sat upon the axle-tree of the chariot-wheel, and said, What a dust do I raise ! So are there some vain persons, that whatsoever goeth alone, or moveth upon greater means, if they have never so little hand in it, they think it is they that carry it. They that are glorious must needs be factious ; for all bravery stands upon comparisons. They must needs be violent to make good their own vaunts : neither can they be secret, and therefore not effectual ; but according to the French proverb, "*Beaucoup de bruit, peu de fruit* : " Much bruit, little fruit. Yet certainly there is use of this quality in civil affairs : where there is an opinion, and fame to be created, either of virtue or greatness, these men are good trumpeters. Again, as Titus Livius noteth, in the case of Antiochus and the Ætolians, there are sometimes great effects of cross lies ; as if a man that negotiates between two princes, to draw them to join in

a war against the third, doth extol the forces of either of them above measure, the one to the other : and sometimes he that deals between man and man, raiseth his own credit with both, by pretending greater interest than he hath in either. And in these and the like kinds, it often falls out, that somewhat is produced of nothing ; for lies are sufficient to breed opinion, and opinion brings on substance. In military commanders and soldiers, vain-glory is an essential point ; for as iron sharpens iron, so by glory one courage sharpeneth another : in cases of great enterprise, upon charge and adventure, a composition of glorious natures doth put life into business ; and those that are of solid and sober natures, have more of the ballast than of the sail. In fame of learning, the flight will be slow, without some feathers of ostentation : “ *Qui de contemnenda gloria libros scribunt, nomen suum inscribunt.*” Socrates, Aristotle, Galen, were men full of ostentation. Certainly vain-glory helpeth to perpetuate a man’s memory ; and virtue was never so beholden to human nature, as it received its due at the second-hand. Neither had the fame of Cicero, Seneca, Plinius Secundus, born her age so well, if it had not been joined with some vanity in themselves : like unto varnish, that makes ceilings not only shine but last. But all this while, when I speak of vain-glory, I mean not of that property that Tacitus doth attribute to Mucianus, “ *omnium, quæ dixerat, feceratque, arte quadam ostentator :*” for that proceeds not of vanity, but of natural magnanimity and discretion : and in some persons, is not only comely but gracious. For excusations, cessions, modesty itself well governed, are but arts of ostentation. And amongst those arts, there is none better than that which Plinius Secundus speaketh of ; which is to be liberal of praise and commendation to others, in that wherein a man’s self hath any perfection. For, saith Pliny, very wittily, “ in commending another you do yourself right ; for he that you commend is either superior to you in that you commend, or inferior. If he be inferior, if he be to be commended, you much more. If he be superior, if he be not to be commended, you much less.” Glorious men are the scorn of wise men ; the admiration of fools ; the idols of parasites ; and slaves of their own vaunts.

LV. OF HONOUR AND REPUTATION.

The winning of honour is but the revealing of a man’s virtue and worth without disadvantage. For some in their actions do woo and affect honour and reputation ; which sort of men are commonly much talked of, but inwardly little admired. And some, contrariwise, darken their virtue in the show of it : so as they be undervalued in opinion. If a man perform that which hath not been attempted before, or attempted and given over ; or hath been achieved, but not with so good circumstance : he shall purchase more honour than by effecting a matter of greater difficulty or virtue, wherein he is but a follower. If a man so temper his actions, as in some one of them he doth content every faction or combination of people, the music will be the

fuller. A man is an ill husband of his honour that entereth into any action, the failing wherein may disgrace him more than the carrying of it through can honour him. Honour that is gained and broken upon another, hath the quickest reflexion, like diamonds cut with fascets. And therefore let a man contend to excel any competitors of his in honour, in out-shooting them, if he can, in their own bow. Discreet followers and servants help much to reputation: "omnis fama a domesticis emanat." Envy, which is the canker of honour, is best extinguished by declaring a man's self in his ends, rather to seek merit than fame; and by attributing a man's successes rather to divine providence and felicity, than to his own virtue or policy. The true marshalling of the degrees of sovereign honour, are these. In the first place are *Conditores Imperiorum*; founders of states and commonwealths: such as were Romulus, Cyrus, Cæsar, Ottoman, Ismael. In the second place are *Legislatores*, lawgivers, which are also called second founders, or *Perpetui Principes*, because they govern by their ordinances, after they are gone: such were Lycurgus, Solon, Justinian, Edgar, Alphonsus of Castile the wise, that made the *Siete partidas*. In the third place are *Liberatores*, or *Salvatores*; such as compound the long miseries of civil wars, or deliver their countries from servitude of strangers or tyrants: as Augustus Cæsar, Vespasianus, Aurelianus, Theodoricus, King Henry the Seventh of England, King Henry the Fourth of France. In the fourth place are *Propagatores*, or *Propugnatores Imperii*, such as in honourable wars enlarge their territories, or make noble defence against invaders. And in the last place are *Patres Patriæ*, which reign justly, and make the times good wherein they live. Both which last kinds need no examples, they are in such number. Degrees of honour in subjects are: first, *Participes Curarum*, those upon whom princes do discharge the greatest weight of their affairs; their right hands, as we call them. The next are *Duces Belli*, great leaders; such as are prince's lieutenants, and do them notable services in the wars. The third are *Gratosi*, favourites; such as exceed not this scantling, to be solace to the sovereign, and harmless to the people: and the fourth, *Negotiis Pares*; such as have great places under princes, and execute their places with sufficiency. There is an honour likewise, which may be ranked amongst the greatest, which happeneth rarely: that is, of such as sacrifice themselves to death or danger for the good of their country; as was M. Regulus and the two Decii.

LVI. OF JUDICATURE.

Judges ought to remember, that their office is *jus dicere*, and not *jus dare*; to interpret law, and not to make law, or give law. Else will it be like the authority claimed by the church of Rome; which, under pretext of exposition of scripture, doth not stick to add and alter; and to pronounce that which they do not find; and by show of antiquity to introduce novelty. Judges ought to be more learned than witty; more reverend than plausible; and more advised than confi-

dent. Above all things, integrity is their portion and proper virtue. "Cursed," saith the law, "is he that removeth the land-mark." The mislayer of a mere-stone is to blame : but it is the unjust judge that is the capital remover of land-marks, when he defineth amiss of lands and property. One foul sentence doth more hurt than many foul examples. For these do but corrupt the stream : the other corrupteth the fountain. So saith Solomon ; "*Fons turbatus, et vena corrupta, est justus cadens in causa sua coram adversario.*" The office of judges may have reference unto the parties that sue ; unto the advocates that plead ; unto the clerks and ministers of justice underneath them ; and to the sovereign or state above them.

First, for the causes or parties that sue. "There be," saith the Scripture, "that turn judgment into wormwood ;" and surely there be also that turn it into vinegar : for injustice maketh it bitter, and delays make it sour. The principal duty of a judge is, to suppress force and fraud ; whereof force is the more pernicious when it is open ; and fraud when it is close and disguised. Add thereto contentious suits, which ought to be spewed out as the surfeit of courts. A judge ought to prepare his way to a just sentence, as God useth to prepare his way, by raising valleys and taking down hills : so when there appeareth on either side an high hand, violent prosecution, cunning advantages taken, combination, power, great counsel, then is the virtue of a judge seen, to make inequality equal ; that he may plant his judgment as upon an even ground. "*Qui fortiter emungit, elicit sanguinem ;*" and where the wine-press is hard wrought, it yields a harsh wine, that tastes of the grape-stone. Judges must beware of hard constructions and strained inferences ; for there is no worse torture than the torture of laws ; especially in case of laws penal they ought to have care, that that which was meant for terror be not turned into rigour ; and that they bring not upon the people that shower whereof the Scripture speaketh, "*pluet super eos laqueos :*" for penal laws pressed are a shower of snares upon the people. Therefore let penal laws, if they have been sleepers of long, or if they be grown unfit for the present time, be by wise judges confined in the execution ; "*Judicis officium est, ut res, ita tempora rerum,*" etc. In causes of life and death, judges ought, as far as the law permitteth, in justice to remember mercy : and to cast a severe eye upon the example, but a merciful eye upon the person.

Secondly, for the advocates and counsel that plead ; patience and gravity of hearing is an essential part of justice ; and an over-speaking judge is no well-tuned cymbal. It is no grace to a judge, first to find that which he might have heard in due time from the bar ; or to show quickness of conceit in cutting off evidence or counsel too short ; or to prevent information by questions, though pertinent. The parts of a judge in hearing are four : to direct the evidence ; to moderate length, repetition, or impertinency of speech ; to recapitulate, select, and collate, the material points of that which hath been said ; and to give the rule or sentence. Whatsoever is above these is too much ; and proceedeth either of glory and willingness to speak, or of impatience to

hear, or of shortness of memory, or of want of a stayed and equal attention. It is a strange thing to see, that the boldness of advocates should prevail with judges; whereas they should imitate God, in whose seat they sit: who "represseth the presumptuous, and giveth grace to the modest." But it is more strange that judges should have noted favourites; which cannot but cause multiplication of fees and suspicion of bye-ways. There is due from the judge to the advocate some commendation and gracing where causes are well handled, and fairly pleaded; especially towards the side which obtaineth not: for that upholds in the client the reputation of his counsel, and beats down in him the conceit of his cause. There is likewise due to the public a civil reprehension of advocates, where there appeareth cunning counsel, gross neglect, slight information, indiscreet pressing, or an over-bold defence. And let not the counsel at the bar chop with the judge, nor wind himself into handling of the cause anew, after the judge hath declared his sentence: but on the other side, let not the judge meet the cause half way; nor give occasion to the party to say, his counsel or proofs were not heard.

Thirdly, for that that concerns clerks and ministers. The place of justice is an hallowed place; and therefore not only the bench, but the footpace, and precincts, and purprise thereof, ought to be preserved without scandal and corruption. For certainly "grapes," as the Scripture saith, "will not be gathered of thorns or thistles:" neither can justice yield her fruit with sweetness, amongst the briars and brambles of catching and polling clerks and ministers. The attendance of courts is subject to four bad instruments. First, certain persons that are sowers of suits; which make the court swell, and the country pine. The second sort is of those that engage courts in quarrels of jurisdiction, and are not truly *amici curiæ*, but *parasitiæ curiæ*, in puffing a court up beyond her bounds, for their own scraps and advantage. The third sort is of those that may be accounted the left hands of courts; persons that are full of nimble and sinister tricks and shifts, whereby they pervert the plain and direct courses of courts, and bring justice into oblique lines and labyrinths. And the fourth is, the poller and exacter of fees; which justifies the common resemblance of the courts of justice to the bush, whereunto while the sheep flies for defence in weather, he is sure to lose part of his fleece. On the other side, an ancient clerk, skilful in precedents, wary in proceeding, and understanding in the business of the court, is an excellent finger of a court, and doth many times point the way to the judge himself.

Fourthly, for that which may concern the sovereign and estate. Judges ought above all to remember the conclusion of the Roman twelve tables; "*salus populi suprema lex*;" and to know that laws, except they be in order to that end, are but things captious, and oracles not well inspired. Therefore it is an happy thing in a state when kings and states do often consult with judges; and again, when judges do often consult with the king and state; the one, when there is matter of law intervenient in business of state; the other, when there is some consideration of state intervenient in matters of law.

For many times the things deduced to judgment may be *meum* and *tuum*, when the reason and consequence thereof may trench to point of estate: I call matter of estate, not only the parts of sovereignty, but whatsoever introduceth any great alteration, or dangerous precedent; or concerneth manifestly any great portion of people. And let no man weakly conceive, that just laws and true policy have any antipathy; for they are like the spirits and sinews, that one moves with the other. Let judges also remember, that Solomon's throne was supported by lions on both sides; let them be lions, but yet lions under the throne: being circumspect that they do not check or oppose any points of sovereignty. Let not judges also be so ignorant of their own right, as to think there is not left to them, as a principal part of their office, a wise use and application of laws. For they may remember what the apostle saith of a greater law than theirs; "*Nos scimus quia lex bona est, modo quis ea utatur legitime.*"

LVII. OF ANGER.

To seek to extinguish anger utterly, is but a bravery of Stoics. We have better oracles: "Be angry, but sin not. Let not the sun go down upon your anger." Anger must be limited and confined, both in *rate* and in time. We will first speak, how the natural inclination and habit, to be angry, may be attempered and calmed. Secondly, how the particular motions of anger may be repressed, or at least refrained from doing mischief. Thirdly, how to raise anger, or appease anger, in another.

For the first, there is no other way but to meditate and ruminate well upon the effects of anger, how it troubles man's life. And the best time to do this, is to look back upon anger when the fit is thoroughly over. Seneca saith well; That anger is like ruin, which breaks itself upon that it falls. The Scripture exhorteth us, "to possess our souls in patience." Whosoever is out of patience, is out of possession of his soul. Men must not turn bees:

———*Animasque in vulnere ponunt.*

Anger is certainly a kind of baseness; as it appears well in the weakness of those subjects in whom it reigns; children, women, old folks, sick folks. Only men must beware, that they carry their anger rather with scorn, than with fear; so they may seem rather to be above the injury than below it. Which is a thing easily done, if a man will give law to himself in it.

For the second point, the causes and motives of anger are chiefly three. First, to be too sensible of hurt: for no man is angry that feels not himself hurt: and therefore tender and delicate persons must needs be oft angry; they have so many things to trouble them, which more robust natures have little sense of. The next is, the apprehension and construction of the injury offered to be, in the circumstances thereof, full of contempt. For contempt is that which putteth an edge upon anger, as much or more than the hurt itself. And therefore

when men are ingenious in picking out circumstances of contempt, they do kindle their anger much. Lastly, opinion of the touch of a man's reputation doth multiply and sharpen anger. Wherein the remedy is, that a man should have, as Consalvo was wont to say, "*telam honoris crassioorem*." But in all refrainings of anger, it is the best remedy to win time; and to make a man's self believe, that the opportunity of his revenge is not yet come: but that he foresees a time for it, and so to still himself in the mean time, and reserve it.

To contain anger from mischief, though it take hold of a man, there be two things whereof you must have special caution. The one, of extreme bitterness of words, especially if they be aculeate and proper; for *communia maledicta* are nothing so much: and again, that in anger a man reveal no secrets; for that makes them not fit for society. The other, that you do not peremptorily break off, in any business, in a fit of anger: but howsoever you show bitterness, do not act anything that is not revocable.

For raising and appeasing anger in another; it is done chiefly by choosing of times. When men are frowardest and worst disposed, to incense them. Again, by gathering, as was touched before, all that you can find out to aggravate the contempt: and the two remedies are by the contraries. The former, to take good times, when first to relate to a man an angry business; for the first impression is much. And the other is, to sever, as much as may be, the construction of the injury, from the point of contempt: imputing it to misunderstanding, fear, passion, or what you will.

LVIII. OF VICISSITUDE OF THINGS

Solomon saith, "There is no new thing upon the earth:" so that as Plato had an imagination, that all knowledge was but remembrance; so Solomon giveth his sentence, "that all novelty is but oblivion." Whereby you may see, the river of Lethe runneth as well above ground as below. There is an abstruse astrologer, that saith, if it were not for two things that are constant (the one is, that the fixed stars ever stand at like distance one from another, and never come nearer together, nor go farther asunder: the other, that the diurnal motion perpetually keepeth time) no individual would last one moment. Certain it is, that the matter is in a continual flux, and never at a stay. The great winding-sheets, that bury all things in oblivion, are two: deluges and earthquakes. As for conflagrations, and great droughts, they do merely dispeople and destroy. Phaeton's car went but a day. And the three years drought in the time of Elias, was particular, and left people alive. As for the great burnings by lightnings, which are often in the West Indies, they are but narrow. But in the other two destructions, by deluge and earthquake, it is farther to be noted, that the remnant of people which hap to be reserved, are commonly ignorant and mountainous people, that can give no account of the time past: so that the oblivion is all one, as if none had been left. If you consider well of the people of the West Indies, it is very probable

that they are a newer or a younger people than the people of the old world : and it is much more likely, that the destruction that hath heretofore been there, was not by earthquakes (as the Egyptian priest told Solon, concerning the island of Atlantis. that it was swallowed by an earthquake) but rather, that it was desolated by a particular deluge ; for earthquakes are seldom in those parts : but, on the other side, they have such pouring rivers, as the rivers of Asia, and Africa, and Europe, are but brooks to them. Their Andes likewise, or mountains are far higher than those with us ; whereby it seems that the remnants of generation of men were in such a particular deluge saved. As for the observation that Machiavel hath, that the jealousy of sects doth much extinguish the memory of things ; traducing Gregory the Great, that he did what in him lay to extinguish all heathen antiquities ; I do not find that those zeals do any great effects nor last long ; as it appeared in the succession of Sabinian, who did revive the former antiquities.

The vicissitude or mutations in the superior globe are no fit matter for this present argument. It may be, Plato's great year, if the world should last so long, would have some effect, not in renewing the state of like individuals (for that is the fume of those, that conceive the celestial bodies have more accurate influences upon these things below than indeed they have), but in gross. Comets, out of the question, have likewise power and effect over the gross and mass of things : but they are rather gazed upon, and waited upon in their journey, than wisely observed in their effects ; specially in their respective effects : that is what kind of comet, for magnitude, colour, version of the beams, placing in the region of heaven, or lasting, produceth what kind of effects.

There is a toy, which I have heard, and I would not have it given over, but waited upon a little. They say it is observed in the Low Countries, I know not in what part, that every five-and-thirty years, the same kind and sute of years and weathers comes about again : as great frost, great wet, warm winters, summers with little heat, and the like ; and they call it the prime. It is a thing I do the rather mention, because computing backwards, I have found some concurrence.

But to leave these points of nature, and to come to men. The greatest vicissitudes of things amongst men is the vicissitude of sects and religions, for those orbs rule in men's minds most. The true religion is built upon the rock : the rest are tossed upon the waves of time. To speak therefore of the causes of new sects, and to give some counsel concerning them, as far as the weakness of human judgment can give stay to so great revolutions.

When the religion formerly received is rent by discords ; and when the holiness of the professors of religion is decayed and full of scandal : and withal the times be stupid, ignorant, and barbarous, you may doubt the springing up of a new sect ; if then also there should arise any extravagant and strange spirit to make himself author thereof : all which points held when Mahomet published his law. If a new sect have not two properties, fear it not, for it will not spread. The one is

the supplanting, or the opposing of authority established, for nothing is more popular than that. The other is the giving licence to pleasures and a voluptuous life. For as for speculative heresies, such as were in ancient times the Arians, and now the Arminians, though they work mightily upon men's wits, yet they do not produce any great alterations in states, except it be by the help of civil occasions. There be three manner of plantations of new sects: by the power of signs and miracles; by the eloquence and wisdom of speech and persuasion; and by the sword. For martyrdoms, I reckon them amongst miracles, because they seem to exceed the strength of human nature; and I may do the like of superlative and admirable holiness of life. Surely there is no better way to stop the rising of new sects and schisms, than to reform abuses; to compound the smaller differences: to proceed mildly, and not with sanguinary persecutions; and rather to take off the principal authors, by winning and advancing them, than to enrage them by violence and bitterness.

The changes and vicissitudes in wars are many, but chiefly in three things: in the seats or stages of the war; in the weapons; and in the manner of the conduct. Wars, in ancient time, seemed more to move from East to West: for the Persians, Assyrians, Arabians, Tartars, which were the invaders, were all eastern people. It is true, the Gauls were western; but we read but of two incursions of theirs, the one to Gallo-Græcia, the other to Rome. But east and west have no certain points of heaven; and no more have the wars, either from the east or west, any certainty of observation. But north and south are fixed; and it hath seldom or never been seen, that the far southern people have invaded the northern, but contrariwise; whereby it is manifest, that the northern tract of the world is in nature the more martial region, be it in respect of the stars of that hemisphere, or of the great continents that are upon the north; whereas the south part, for ought that is known, is almost all sea; or (which is most apparent) of the cold of the northern parts; which is that which, without aid of discipline, doth make the bodies hardest, and the courages warmest.

Upon the breaking and shivering of a great state and empire, you may be sure to have wars. For great empires, while they stand, do enervate and destroy the forces of the natives which they have subdued, resting upon their own protecting forces: and then when they fail also, all goes to ruin, and they become a prey. So was it in the decay of the Roman empire, and likewise in the empire of Almaigne, after Charles the Great, every bird taking a feather; and were not unlike to befall to Spain, if it should break. The great accessions and unions of kingdoms do likewise stir up wars. For when a state grows to an over-power, it is like a great flood, that will be sure to overflow. As it hath been seen in the states of Rome, Turkey, Spain, and others. Look, when the world hath fewest barbarous people, but such as commonly will not marry or generate, except they know means to live, as it is almost everywhere at this day, except Tartary, there is no danger of inundations of people: but when there be great shoals of people, which go on to populate, without foreseeing means of life and sustenta-

tion, it is of necessity that once in an age or two they discharge a portion of their people upon other nations ; which the ancient northern people were wont to do by lot, casting lots what part should stay at home, and what should seek their fortunes. When a warlike state grows soft and effeminate, they may be sure of a war. For commonly such states are grown rich in the time of their degenerating ; and so the prey inviteth, and their decay in valour encourageth a war.

As for the weapons, it hardly falleth under rule and observation : yet we see, even they have returns and vicissitudes. For certain it is, that ordnance was known in the city of the Oxidracæ in India, and was that which the Macedonians called thunder and lightning, and magic. And it is well known that the use of ordnance have been in China above two thousand years. The condition of weapons, and their improvement, are, first, the fetching afar off, for that outruns the danger, as it is seen in ordnance and muskets. Secondly, the strength of the percussion, wherein likewise ordnance do exceed all arietations and ancient inventions. The third is, the commodious use of them, as that they may serve in all weathers, that the carriage may be light and manageable, and the like.

For the conduct of the war : at the first, men rested extremely upon number : they did put the wars likewise upon main force and valour, pointing days for pitched fields, and so trying it out upon an even match : and they were more ignorant in arranging and arraying their battles. After, they grew to rest upon numbers rather competent than vast ; they grew to advantages of place, cunning diversions, and the like : and they grew more skilful in the ordering of their battles.

In the youth of a state, arms do flourish ; in the middle age of a state, learning ; and then both of them together for a time : in the declining age of a state, mechanical arts and merchandise. Learning hath its infancy, when it is but beginning and almost childish : then its youth, when it is luxuriant and juvenile : then its strength of years, when it is solid and reduced : and lastly, its old age, when it waxeth dry and exhaust. But it is not good to look too long upon these turning wheels of vicissitude, lest we become giddy. As for the philology of them, that is but a circle of tales, and therefore not fit for this writing.

OF A KING.

1. A king is a mortal god on earth, unto whom the living God hath lent his own name as a great honour : but withal told him, he should die like a man, lest he should be proud and flatter himself, that God hath with his name imparted unto him his nature also.

2. Of all kind of men, God is the least beholden unto them ; for he doth most for them, and they do ordinarily least for him.

3. A king that would not feel his crown too heavy for him, must wear it every day ; but if he think it too light, he knoweth not of what metal it is made.

4. He must make religion the rule of government, and not to balance the scale : for he that casteth in religion only to make the scales even, his own weight is contained in those characters, "Mene, mene, tekel, upharsin," "He is found too light, his kingdom shall be taken from him."

5. And that king that holds not religion the best reason of state is void of all piety and justice, the supporters of a king.

6. He must be able to give counsel himself, but not rely thereupon ; for though happy events justify their counsels, yet it is better that the evil event of good advice be rather imputed to a subject than a sovereign.

7. He is the fountain of honour, which should not run with a waste pipe, lest the courtiers sell the water, and then, as papists say of their holy wells, it loses the virtue.

8. He is the life of the law, not only as he is *lex loquens* himself, but because he animateth the dead letter, making it active towards all his subjects *premio et pana*.

9. A wise king must do less in altering his laws than he may ; for new government is ever dangerous. It being true in the body politic, as in the corporal, that "*omnis subita immutatio est periculosa*;" and though it be for the better, yet it is not without a fearful apprehension ; for he that changeth the fundamental laws of a kingdom, thinketh there is no good title to a crown, but by conquest.

10. A king that setteth to sale seats of justice, oppresseth the people : for he teacheth his judges to sell justice ; and "*pretio parata pretio venditur justitia*."

11. Bounty and magnificence are virtues very regal, but a prodigal king is nearer a tyrant than a parsimonious ; for store at home draweth not his contemplations abroad : but want supplieth itself of what is next, and many times the next way : a king herein must be wise, and know what he may justly do.

12. That king which is not feared, is not loved ; and he that is well seen in his craft, must as well study to be feared as loved ; yet not loved for fear, but feared for love.

13. Therefore, as he must always resemble Him whose great name he beareth, and that as in manifesting the sweet influence of his mercy on the severe stroke of his justice sometimes, so in this not to suffer a man of death to live ; for besides that the land doth mourn, the restraint of justice towards sin doth more retard the affection of love, than the extent of mercy doth inflame it : and sure where love is [ill] bestowed, fear is quite lost.

14. His greatest enemies are his flatterers ; for though they ever speak on his side, yet their words still make against him.

15. The love which a king oweth to a weal public, should not be restrained to any one particular ; yet that his more special favour do reflect upon some worthy ones, is somewhat necessary, because there are few of that capacity.

16. He must have a special care of five things, if he would not have his crown to be but to him *infelix felicitus*

First, that *simulata sanctitas* be not in the Church ; for that is *duplex iniquitas*.

Secondly, that *inutilis æquitas* sit not in the chancery ; for that is *inepta misericordia*.

Thirdly, that *utilis iniquitas* keep not the exchequer ; for that is *crudele latrocinium*.

Fourthly, that *fidelis temeritas* be not his general ; for that will bring but *seram penitentiam*.

Fifthly, that *infidelis prudentia* be not his secretary ; for that is *anguis sub viridi herba*.

To conclude ; as he is of the greatest power, so he is subject to the greatest cares, made the servant of his people, or else he were without a calling at all.

He then that honoureth him not is next an atheist, wanting the fear of God in his heart.

A FRAGMENT OF AN ESSAY ON FAME.

The poets make Fame a monster. They describe her in part finely and elegantly ; and in part gravely and sententiously. They say : Look, how many feathers she hath, so many eyes she hath underneath ; so many tongues ; so many voices ; she pricks up so many ears.

This is a flourish : there follow excellent parables : as, that she gathereth strength in going ; that she goeth upon the ground, and yet hideth her head in the clouds : that in the day-time she sitteth in a watch tower, and flieth most by night : that she mingleth things done with things not done ; and that she is a terror to great cities. But that which passeth all the rest is, they do recount that the Earth, mother of the giants, that made war against Jupiter, and were by him destroyed, thereupon in an anger brought forth Fame ; for certain it is that rebels, figured by the giants, and seditious fames and libels, are but brothers and sisters ; masculine and feminine. But now if a man can tame this monster, and bring her to feed at the hand, and govern her, and with her fly other ravening fowl, and kill them, it is somewhat worth. But we are infected with the stile of the poets. To speak now in a sad and a serious manner ; there is not in all the politics a place less handled, and more worthy to be handled, than this of fame. We will therefore speak of these points : what are false fames ; and what are true fames ; and how they may be best discerned ; how fumes may be sown and raised ; how they may be spread and multiplied ; and how they may be checked and laid dead. And other things concerning the nature of fame. Fame is of that force, as there is scarcely any great action wherein it hath not a great part, especially in the war. Mucianus undid Vitellius, by a fame that he scattered, that Vitellius had in purpose to remove the legions of Syria into Germany, and the legions of Germany into Syria ; whereupon the legions of Syria were infinitely inflamed. Julius Cæsar took Pompey unprovided, and laid asleep his industry and preparations, by a

fame that he cunningly gave out, how Caesar's own soldiers loved him not ; and being wearied with the wars, and laden with the spoils of Gaul, would forsake him as soon as he came into Italy. Livia settled all things for the succession of her son Tiberius, by continual giving out that her husband Augustus was upon recovery and amendment. And it is an usual thing with the bashaws, to conceal the death of the Great Turk from the janizaries and men of war, to save the sacking of Constantinople and other towns, as their manner is. Themistocles made Xerxes, King of Persia, post apace out of Grecia, by giving out that the Grecians had a purpose to break his bridge of ships which he had made athwart the Hellespont. There be a thousand such like examples, and the more they are, the less they need to be repeated, because a man meeteth with them every where : therefore let all wise governors have as great a watch and care over fames, as they have of the actions and designs themselves.

AN ESSAY ON DEATH.

I have often thought upon death, and I find it the least of all evils. All that which is past is as a dream ; and he that hopes or depends upon time coming, dreams waking. So much of our life as we have discovered is already dead ; and all those hours which we share, even from the breasts of our mother, until we return to our grand-mother the earth, are part of our dying days ; whereof even this is one, and those that succeed are of the same nature, for we die daily ; and as others have given place to us, so we must in the end give way to others.

Physicians, in the name of death, include all sorrow, anguish, disease, calamity, or whatsoever can fall in the life of man, either grievous or unwelcome : but these things are familiar unto us, and we suffer them every hour ; therefore we die daily, and I am older since I affirmed it.

I know many wise men that fear to die ; for the change is bitter, and flesh would refuse to prove it : besides, the expectation brings terror, and that exceeds the evil. But I do not believe that any man fears to be dead, but only the stroke of death : and such are my hopes, that if heaven be pleased, and nature renew but my lease for twenty-one years more, without asking longer days, I shall be strong enough to acknowledge without murmuring that I was begotten mortal. Virtue walks not in the highway, though she go *per alta* ; this is strength and the blood to virtue, to condemn things that be desired, and to neglect that which is feared.

Why should man be in love with his fetters, though of gold ? Art thou drowned in security ? Then I say thou art perfectly dead. For though thou movest, yet thy soul is buried within thee, and thy good angel either forsakes his guard or sleeps. There is nothing under heaven, saving a true friend, who cannot be counted within the number of moveables, unto which my heart doth lean. And this dear freedom hath begotten me this peace, that I mourn not for that end which

must be, nor spend one wish to have one minute added to the incertain date of my years. It was no mean apprehension of Lucian, who says of Menippus, that in his travels through hell he knew not the kings of the earth from other men, but only by their louder cryings and tears: which was fostered in them through the remorseful memory of the good days they had seen, and the fruitful havings which they so unwillingly left behind them: he that was well seated looked back at his portion, and was loth to forsake his farm; and others, either minding marriages, pleasures, profit, or preferment, desired to be excused from death's banquet; they had made an appointment with earth, looking at the blessings, not the hand that enlarged them, forgetting how unclothedly they came thither, or with what naked ornaments they were arrayed.

But were we servants of the precept given, and observers of the heathen's rule, "*memento mori*," and not become benighted with this seeming felicity, we should enjoy it as men prepared to lose, and not wind up our thoughts upon so perishing a fortune: he that is not slackly strong, as the servants of pleasure, how can he be found unready to quit the veil and false visage of his perfection? The soul having shaken off her flesh, doth then set up for herself, and contemning things that are under, shows what finger hath enforced her; for the souls of idiots are of the same piece with those of statesmen, but now and then nature is at a fault, and this good guest of ours takes soil in an imperfect body, and so is slackened from showing her wonders; like an excellent musician, which cannot utter himself upon a defective instrument.

But see how I am swerved, and lose my course, touching at the soul, that doth least hold action with death, who hath the surest property in this frail act; his stile is the end of all flesh, and the beginning of incorruption.

This ruler of monuments leads men for the most part out of this world with their heels forward; in token that he is contrary to life; which being obtained, sends men headlong into this wretched theatre, where being arrived, their first language is that of mourning. Nor in my own thoughts, can I compare men more fitly to anything than to the Indian fig-tree, which being ripened to his full height, is said to decline his branches down to the earth; whereof she conceives again, and they become roots in their own stock.

So man having derived his being from the earth, first lives the life of a tree, drawing his nourishment as a plant, and made ripe for death he tends downwards, and is sowed again in his mother the earth, where he perisheth not, but expects a quickening.

So we see death exempts not a man from being, but only presents an alteration; yet there are some men, I think, that stand otherwise persuaded. Death finds not a worse friend than an alderman, to whose door I never knew him welcome; but he is an importunate guest, and will not be said nay.

And though they themselves shall affirm, that they are not within, yet the answer will not be taken; and that which heightens their fear

is, that they know they are in danger to forfeit their flesh, but are not wise of the payment day : which sickly uncertainty is the occasion that, for the most part, they step out of this world unfurnished for their general account, and being all unprovided, desire yet to hold their gravity, preparing their souls to answer in scarlet.

Thus I gather, that death is disagreeable to most citizens, because they commonly die intestate: this being a rule, that when their will is made, they think themselves nearer a grave than before : now they, out of the wisdom of thousands, think to scare destiny, from which there is no appeal, by not making a will, or to live longer by protestation of their unwillingness to die. They are for the most part well made in this world, accounting their treasure by legions, as men do devils, their fortune looks towards them, and they are willing to anchor at it, and desire, if it be possible, to put the evil day far off from them, and to adjourn their ungrateful and killing period.

No, these are not the men which have bespoken death, or whose looks are assured to entertain a thought of him.

Death arrives gracious only to such as sit in darkness, or lie heavy burdened with grief and irons ; to the poor Christian, that sits bound in the galley ; to despairful widows, pensive prisoners, and deposed kings : to them whose fortune runs back, and whose spirit mutinies ; unto such death is a redeemer, and the grave a place for retiredness and rest.

These wait upon the shore of death, and waft unto him to draw near, wishing above all others to see his star, that they might be led to his place, wooing the remorseless sisters to wind down the watch of their life, and to break them off before the hour.

But death is a doleful messenger to an usurer, and fate untimely cuts their thread : for it is never mentioned by him, but when rumours of war and civil tumults put him in mind thereof.

And when many hands are armed, and the peace of a city in disorder, and the foot of the common soldiers sounds an alarm on his stairs, then perhaps such a one, broken in thoughts of his moneys abroad, and cursing the monuments of coin which are in his house, can be content to think of death, and, being hasty of perdition, will perhaps hang himself, lest his throat should be cut ; provided that he may do it in his study, surrounded with wealth, to which his eye sends a faint and languishing salute, even upon the turning off ; remembering always, that he have time and liberty, by writing, to depute himself as his own heir.

For that is a great peace to his end, and reconciles him wonderfully upon the point.

Herein we all dally with ourselves, and are without proof till necessity. I am not of those that dare promise to pine away myself in vain-glory, and I hold such to be but feat boldness, and them that dare commit it to be vain. Yet, for my part, I think nature should do me great wrong, if I should be so long in dying, as I was in being born.

To speak truth, no man knows the lists of his own patience ; nor can divine how able he shall be in his sufferings, till the storm come :

the perfectest virtue being tried in action ; but I would, out of a care to do the best business well, ever keep a guard, and stand upon keeping faith and a good conscience.

And if wishes might find place, I would die together, and not my mind often, and my body once ; that is, I would prepare for the messengers of death, sickness and affliction, and not wait long, or be attempted by the violence of pain.

Herein I do not profess myself a Stoic, to hold grief no evil, but opinion, and a thing indifferent.

But I consent with Cæsar, that the suddenest passage is easiest, and there is nothing more awakens our resolve and readiness to die, than the quieted conscience, strengthened with opinion that we shall be well spoken of upon earth by those that are just, and of the family of virtue ; the opposite whereof is a fury to man, and makes even life unsweet.

Therefore, what is more heavy than evil fame deserved ? Or, likewise, who can see worse days than he that yet living doth follow at the funerals of his own reputation ?

I have laid up many hopes, that I am privileged from that kind of mourning, and could wish the like peace to all those with whom I wage love.

I might say much of the commodities that death can sell a man ; but briefly, death is a friend of ours, and he that is not ready to entertain him, is not at home. Whilst I am, my ambition is not to fore-flow the tide ; I have but so to make my interest of it, as I may account for it ; I would wish nothing but what might better my days, nor desire any greater place than the front of good opinion. I make not love to the continuance of days, but to the goodness of them ; nor wish to die, but refer myself to my hour, which the great Dispenser of all things hath appointed me ; yet as I am frail, and suffered for the first fault, were it given me to choose, I should not be earnest to see the evening of my age ; that extremity of itself being a disease, and a mere return into infancy : so that if perpetuity of life might be given me, I should think what the Greek poet said, Such an age is a mortal evil. And since I must needs be dead, I require it may not be done before mine enemies, that I be not stript before I be cold ; but before my friends. The night was even now ; but that name is lost ; it is not now late, but early. Mine eyes begin now to discharge their watch, and compound with this fleshly weakness for a time of perpetual rest ; and I shall presently be as happy for a few hours, as I had died the first hour I was born.

THE FIRST BOOK OF THE PROFICIENCE AND ADVANCEMENT OF LEARNING.

TO THE KING.

THERE were under the law, excellent king, both daily sacrifices, and freewill offerings : the one proceeding upon ordinary observance, the other upon a devout cheerfulness : in like manner there belongeth to kings from their servants, both tribute of duty, and presents of affection. In the former of these, I hope I shall not live to be wanting, according to my most humble duty, and the good pleasure of your majesty's employments : for the latter, I thought it more respective to make choice of some oblation, which might rather refer to the propriety and excellency of your individual person, than to the business of your crown and state.

Wherefore representing your majesty many times unto my mind, and beholding you not with the inquisitive eye of presumption, to discover that which the Scripture telleth me is inscrutable, but with the observant eye of duty and admiration : leaving aside the other parts of your virtue and fortune, I have been touched, yea, and possessed with an extreme wonder at those your virtues and faculties, which the philosophers call intellectual : the largeness of your capacity, the faithfulness of your memory, the swiftness of your apprehension, the penetration of your judgment, and the facility and order of your elocution : and I have often thought, that of all the persons living, that I have known, your majesty were the best instance to make a man of Plato's opinion, that all knowledge is but remembrance, and that the mind of man by nature knoweth all things, and hath but her own native and original notions (which by the strangeness and darkness of this tabernacle of the body are sequestered) again revived and restored : such a light of nature I have observed in your majesty, and such a readiness to take flame, and blaze from the least occasion presented, or the least spark of another's knowledge delivered. And as the Scripture saith of the wisest king, "That his heart was as the sands of the sea ;" which though it be one of the largest bodies, yet it consisteth of the smallest and finest portions : so hath God given your majesty a composition of understanding admirable, being able to compass and comprehend the greatest matters, and nevertheless

to touch and apprehend the least ; whereas it should seem an impossibility in nature, for the same instrument to make itself fit for great and small works. And for your gift of speech, I call to mind what Cornelius Tacitus saith of Augustus Cæsar: "*Augusto profluens, et quæ principem deceret, eloquentia fuit.*" For, if we note it well, speech that is uttered with labour and difficulty, or speech that savoureth of the affectation of art and precepts, or speech that is framed after the imitation of some pattern of eloquence, though never so excellent ; all this has somewhat servile, and holding of the subject. But your majesty's manner of speech is indeed prince-like, flowing as from a fountain, and yet streaming and branching itself into nature's order, full of facility and felicity, imitating none, and inimitable by any. And as in your civil estate there appeareth to be an emulation and contention of your majesty's virtue with your fortune ; a virtuous disposition with a fortunate regiment ; a virtuous expectation, when time was, of your greater fortune, with a prosperous possession thereof in the due time ; a virtuous observation of the laws of marriage, with most blessed and happy fruit of marriage ; a virtuous and most Christian desire of peace, with a fortunate inclination in your neighbour princes thereunto : so likewise in these intellectual matters, there seemeth to be no less contention between the excellency of your majesty's gifts of nature, and the universality and perfection of your learning. For I am well assured, that this which I shall say is no amplification at all, but a positive and measured truth ; which is, that there hath not been since Christ's time any king, or temporal monarch, which hath been so learned in all literature and erudition, divine and human. For let a man seriously and diligently revolve and peruse the succession of the emperors of Rome, of which Cæsar the dictator, who lived some years before Christ, and Marcus Antoninus, were the best learned ; and so descend to the emperors of Græcia, or of the West ; and then to the lines of France, Spain, England, Scotland, and the rest, and he shall find this judgment is truly made. For it seemeth much in a king, if, by the compendious extractions of other men's wits and labours, he can take hold of any superficial ornaments and shows of learning, or if he countenance and prefer learning and learned men ; but to drink indeed of the true fountains of learning, nay, to have such a fountain of learning in himself, in a king, and in a king born, is almost a miracle. And the more, because there is met in your majesty a rare conjunction, as well of divine and sacred literature, as of profane and human ; so as your majesty standeth invested of that triplicity, which in great veneration was ascribed to the ancient Hermes : the power and fortune of a king, the knowledge and illumination of a priest, and the learning and universality of a philosopher. This propriety, inherent and individual attribute in your majesty, deserveth to be expressed, not only in the fame and admiration of the present time, nor in the history or tradition of the ages succeeding ; but also in some solid work, fixed memorial, and immortal monument, bearing a character or signature, both of the power of a king, and the difference and perfection of such a king.

Therefore I did conclude with myself, that I could not make unto your majesty a better oblation, than of some treatise tending to that end, whereof the sum will consist of these two parts ; the former concerning the excellency of learning and knowledge, and the excellency of the merit and true glory in the augmentation and propagation thereof ; the latter, what the particular acts and works are, which have been embraced and undertaken for the advancement of learning ; and again, what defects and undervalues I find in such particular acts : to the end, that though I cannot positively or affirmatively advise your majesty, or propound unto you framed particulars ; yet I may excite your princely cogitations to visit the excellent treasure of your own mind, and thence to extract particulars for this purpose, agreeable to your magnanimity and wisdom.

In the entrance to the former of these, to clear the way, and, as it were, to make silence, to have the true testimonies concerning the dignity of learning to be better heard, without the interruption of tacit objections ; I think good to deliver it from the discredits and disgraces which it hath received, all from ignorance, but ignorance severally disguised ; appearing sometimes in the zeal and jealousy of divines, sometimes in the severity and arrogance of politicians, and sometimes in the errors and imperfections of learned men themselves.

I hear the former sort say, that knowledge is of those things which are to be accepted of with great limitation and caution ; that the aspiring to overmuch knowledge, was the original temptation and sin, whereupon ensued the fall of man ; that knowledge hath in it somewhat of the serpent, and therefore where it entereth into a man it makes him swell ; *Scientia inflat* : that Solomon gives a censure, "That there is no end of making books, and that much reading is weariness of the flesh ;" and again in another place, "That in spacious knowledge there is much contristation, and that he that increaseth knowledge increaseth anxiety ;" that St. Paul give a caveat, "That we be not spoiled through vain philosophy ;" that experience demonstrates how learned men have been arch-heretics, how learned times have been inclined to atheism, and how the contemplation of second causes doth derogate from our dependence upon God, who is the first cause.

To discover then the ignorance and error of this opinion, and the misunderstanding in the grounds thereof, it may well appear these men do not observe or consider, that it was not the pure knowledge of nature and universality, a knowledge by the light whereof man did give names unto other creatures in paradise, as they were brought before him, according unto their proprieties, which gave the occasion to the fall ; but it was the proud knowledge of good and evil, with an intent in man to give law unto himself, and to depend no more upon God's commandments, which was the form of the temptation. Neither is it any quantity of knowledge, how great soever, that can make the mind of man to swell ; for nothing can fill, much less extend the soul of man, but God, and the contemplation of God ; and therefore Solomon,

speaking of the two principal senses of inquisition, the eye and ear, affirmeth that the eye is never satisfied with seeing, nor the ear with hearing; and if there be no fulness, then is the continent greater than the content: so of knowledge itself, and the mind of man, whereto the senses are but reporters, he defineth likewise in these words, placed after that calendar or ephemerides, which he maketh of the diversities of times and seasons for all actions and purposes; and concludeth thus: "God hath made all things beautiful, or decent, in the true return of their seasons: Also he hath placed the world in man's heart, yet cannot man find out the work which God worketh from the beginning to the end:" declaring, not obscurely, that God hath framed the mind of man as a mirror, or glass, capable of the image of the universal world, and joyful to receive the impression thereof, as the eye joyeth to receive light: and not only delighted in beholding the variety of things, and vicissitude of times, but raised also to find out and discern the ordinances and decrees, which throughout all those changes are infallibly observed. And although he doth insinuate, that the supreme or summary law of nature, which he calleth, "The work which God worketh from the beginning to the end, is not possible to be found out by man;" yet that doth not derogate from the capacity of the mind, but may be referred to the impediments, as of shortness of life, ill conjunction of labours, ill tradition of knowledge over from hand to hand, and many other inconveniencies, whereunto the condition of man is subject. For that nothing parcel of the world is denied to man's inquiry and invention, he doth in another place rule over, when he saith, "The spirit of man is as the lamp of God, wherewith he searcheth the inwardness of all secrets." If then such be the capacity and receipt of the mind of man, it is manifest, that there is no danger at all in the proportion or quantity of knowledge, how large soever, lest it should make it swell or out-compass itself; no, but it is merely the quality of knowledge, which, be it in quantity more or less, if it be taken without the true corrective thereof, hath in it some nature of venom or malignity, and some effects of that venom, which is ventosity or swelling. This corrective spice, the mixture whereof maketh knowledge so sovereign, is charity, which the apostle immediately addeth to the former clause; for so he saith, "knowledge bloweth up, but charity buildeth up;" not unlike unto that which he delivereth in another place: "If I spake," saith he, "with the tongues of men and angels, and had not charity, it were but as a tinkling cymbal;" not but that it is an excellent thing to speak with the tongues of men and angels, but because, if it be severed from charity, and not referred to the good of men and mankind, it hath rather a sounding and unworthy glory, than a meriting and substantial virtue. And as for that censure of Solomon, concerning the excess of writing and reading books, and the anxiety of spirit which redoundeth from knowledge; and that admonition of St. Paul, "That we be not seduced by vain philosophy;" let those places be rightly understood, and they do indeed excellently set forth the true bounds and limitations, whereby human knowledge is confined and circumscribed; and yet without any such contracting or coarctation,

but that it may comprehend all the universal nature of things : for these limitations are three: the first, that we do not so place our felicity in knowledge, as we forget our mortality. The second, that we make application of our knowledge, to give ourselves repose and contentment, and not distaste or repining. The third, that we do not presume by the contemplation of nature to attain to the mysteries of God. For as touching the first of these, Solomon doth excellently expound himself in another place of the same book, where he saith ; " I saw well that knowledge recedeth as far from ignorance, as light doth from darkness ; and that the wise man's eyes keep watch in his head, whereas the fool roundeth about in darkness ; but withal I learned, that the same mortality involveth them both." And for the second, certain it is, there is no vexation or anxiety of mind which resulteth from knowledge, otherwise than merely by accident ; for all knowledge and wonder (which is the seed of knowledge) is an impression of pleasure in itself : but when men fall to framing conclusions out of their knowledge, applying it to their particular, and ministring to themselves thereby weak fears, or vast desires, there groweth that carefulness and trouble of mind which is spoken of : for then knowledge is no more *Lumen siccum*, whereof Heraclitus the profound said, "*Lumen siccum optima anima* ;" but it becometh *Lumen madidam*, or *maceratum*, being steeped and infused in the humours of the affections. And as for the third point, it deserveth to be a little stood upon, and not to be lightly passed over : for if any man shall think by view and inquiry into these sensible and material things to attain that light, whereby he may reveal unto himself the nature or will of God, then indeed is he spoiled by vain philosophy : for the contemplation of God's creatures and works produceth (having regard to the works and creatures themselves) knowledge ; but, having regard to God, no perfect knowledge, but wonder, which is broken knowledge. And therefore it was most aptly said by one of Plato's school, "That the sense of man carrieth a resemblance with the sun, which, as we see openeth and revealeth all the terrestrial globe ; but then again it obscureth and concealeth the stars and celestial globe : so doth the sense discover natural things, but it darkeneth and shutteth up divine." And hence it is true, that it hath proceeded, that divers great learned men have been heretical, whilst they have sought to fly up to the secrets of the Deity by the waxen wings of the senses : and as for the conceit, that too much knowledge should incline a man to atheism, and that the ignorance of second causes should make a more devout dependence upon God, who is the first cause : First, it is good to ask the question which Job asked of his friends : " Will you lie for God, as one man will do for another, to gratify him ?" For certain it is, that God worketh nothing in nature but by second causes ; and if they would have it otherwise believed, it is mere imposture, as it were in favour towards God ; and nothing else but to offer to the author of truth the unclean sacrifice of a lie. But farther, it is an assured truth, and a conclusion of experience, that a little or superficial knowledge of philosophy may incline the mind of man to atheism, but a farther proceeding therein doth bring the mind

back again to religion ; for in the entrance of philosophy, when the second causes, which are next unto the senses, do offer themselves to the mind of man, if it dwell and stay there it may induce some oblivion of the highest cause ; but when a man passeth on farther, and seeth the dependence of causes and the works of providence ; then, according to the allegory of the poets, he will easily believe that the highest link of nature's chain must needs be tied to the foot of Jupiter's chair, To conclude therefore : let no man, upon a weak conceit of sobriety, or an ill-applied moderation, think or maintain, that a man can search too far, or be too well studied in the book of God's word, or in the book of God's works ; divinity or philosophy ; but rather let men endeavour an endless progress, or proficience in both ; only let men beware that they apply both to charity, and not to swelling ; to use, and not to ostentation ; and again, that they do not unwisely mingle, or confound these learnings together.

And as for the disgraces which learning receiveth from politicians, they be of this nature ; that learning doth soften men's minds, and makes them more unapt for the honour and exercise of arms ; that it doth mar and pervert men's dispositions for matter of government and policy, in making them too curious and irresolute by variety of reading, or too peremptory or positive by strictness of rules and axioms, or too immoderate and overweening by reason of the greatness of examples, or too incompatible and differing from the times, by reason of the dissimilitude of examples ; or at least, that it doth divert men's travels from action and business, and bringeth them to a love of leisure and privateness ; and that it doth bring into states a relaxation of discipline, whilst every man is more ready to argue than to obey and execute. Out of this conceit, Cato, surnamed the Censor, one of the wisest men indeed that ever lived, when Carneades the philosopher came in embassage to Rome, and that the young men of Rome began to flock about him, being allured with the sweetness and majesty of his eloquence and learning, gave counsel in open senate, that they should give him his dispatch with all speed, lest he should infect and enchant the minds and affections of the youth, and at unawares bring in an alteration of the manners and customs of the state. Out of the same conceit, or humour, did Virgil, turning his pen to the advantage of his country, and the disadvantage of his own profession, make a kind of separation between policy and government, and between arts and sciences, in the verses so much renowned, attributing and challenging the one to the Romans, and leaving and yielding the other to the Grecians ; "*Tu regere imperio populos, Romane, memento, Hæ tibi erunt artes,* etc." So likewise we see that Anytus, the accuser of Socrates, laid it as an article of charge and accusation against him, that he did, with the variety and power of his discourses and disputations, withdraw young men from due reverence to the laws and customs of their country ; and that he did profess a dangerous and pernicious science, which was, to make the worse matter seem the better, and to suppress truth by force of eloquence and speech.

But these, and the like imputations, have rather a countenance of

gravity, than any ground of justice : for experience doth warrant, that, both in persons and in times, there hath been a meeting and concurrence in learning and arms, flourishing and excelling in the same men, and the same ages. For, as for men, there cannot be a better, nor the like instance, as of that pair, Alexander the Great and Julius Cæsar the dictator ; whereof the one was Aristotle's scholar in philosophy, and the other was Cicero's rival in eloquence : or if any man had rather call for scholars, that were great generals, than generals that were great scholars, let him take Epaminondas the Theban, or Xenophon the Athenian ; whereof the one was the first that abated the power of Sparta, and the other was the first that made war to the overthrow of the monarchy of Persia. And this concurrence is yet more visible in times than in persons, by how much an age is greater object than a man. For both in Ægypt, Assyria, Persia, Græcia, and Rome, the same times that are most renowned for arms, are likewise most admired for learning ; so that the greatest authors and philosophers, and the greatest captains and governors have lived in the same ages. Neither can it otherwise be : for as, in man, the ripeness of the strength of body and mind cometh much about an age, save that the strength of the body cometh somewhat the more early ; so, in states, arms and learning, whereof the one correspondeth to the body, the other to the soul of man, have a concurrence or near sequence in times.

And for matter of policy and government, that learning should rather hurt, than enable thereunto, is a thing very improbable : we see it is accounted an error to commit a natural body to empiric physicians, which commonly have a few pleasing receipts, whereupon they are confident and adventurous, but know neither the causes of diseases, nor the complexions of patients, nor peril of accidents, nor the true method of cures : we see it is a like error to rely upon advocates or lawyers, which are only men of practice, and not grounded in their books, who are many times easily surprised, when matter falleth out besides their experience, to the prejudice of the causes they handle : so, by like reason, it cannot be but a matter of doubtful consequence, if states be managed by empiric statesmen, not well mingled with men grounded in learning. But contrariwise, it is almost without instance contradictory, that ever any government was disastrous that was in the hands of learned governors. For howsoever it hath been ordinary with politic men to extenuate and disable learned men by the names of pedants ; yet in the records of time it appeareth, in many particulars, that the governments of princes in minority (notwithstanding the infinite disadvantage of that kind of state) have nevertheless excelled the government of princes of mature age, even for that reason which they seek to traduce, which is, that by that occasion the state hath been in the hands of pedants : for so was the state of Rome for the first five years, which are so much magnified, during the minority of Nero, in the hands of Seneca, a pedant : so it was again for ten years space or more during the minority of Gordianus the younger, with great applause and contentation in the hands of Misisheus, a pedant : so was

it before that, in the minority of Alexander Severus, in like happiness, in hands not much unlike, by reason of the rule of the women, who were aided by the teachers and preceptors. Nay, let a man look into the government of the bishops of Rome, as by name, into the government of Pius Quintus, and Sextus Quintus, in our times, who were both at their entrance esteemed but as pedantical friars, and he shall find that such popes do greater things, and proceed upon truer principles of state, than those which have ascended to the papacy from an education and breeding in affairs of state and courts of princes ; for although men bred in learning are perhaps to seek in points of convenience, and accommodating for the present, which the Italians call *ragioni di stato*, whereof the same Pius Quintus could not hear spoken with patience, terming them inventions against religion and the moral virtues ; yet on the other side, to recompense that, they are perfect in those same plain grounds of religion, justice, honour, and moral virtue, which if they be well and watchfully pursued, there will be seldom use of those other, no more than of physic in a sound or well dieted body. Neither can the experience of one man's life furnish examples and precedents for the events of one man's life : for as it happeneth sometimes that the grandchild, or other descendant, resembleth the ancestor, more than the son ; so many times occurrences of present times may sort better with ancient examples, than with those of the later or immediate times : and lastly, the wit of one man can no more countervail learning, than one man's means can hold way with a common purse.

And as for those particular seducements, or indispositions of the mind for policy and government, which learning is pretended to insinuate ; if it be granted that any such thing be, it must be remembered withal, that learning ministereth in every of them greater strength of medicine or remedy, than it offereth cause of indisposition or infirmity : for if, by a secret operation, it make men perplexed and irresolute, on the other side, by plain precept, it teacheth them when, and upon what ground, to resolve ; yea, and how to carry things in suspense without prejudice, till they resolve : if it make men positive and regular, it teacheth them what things are in their nature demonstrative, and what are conjectural ; and as well the use of distinctions and exceptions, as the latitude of principles and rules. If it mislead by disproportion, or dissimilitude of examples, it teacheth men the force of circumstances, the errors of comparisons, and all the cautions of application : so that in all these it doth rectify more effectually than it can pervert. And these medicines it conveyeth into men's minds much more forcibly by the quickness and penetration of examples. For let a man look into the errors of Clement the seventh, so lively described by Guicciardine, who served under him, or into the errors of Cicero, painted out by his own pencil in his epistles to Atticus, and he will fly apace from being irresolute. Let him look into the errors of Phocion, and he will beware how he be obstinate or inflexible. Let him but read the fable of Ixion, and it will hold him from being vaporous or imaginative. Let him look into the errors of Cato the second, and he will never be one of the Antipodes, to tread opposite to the present world.

And for the conceit, that learning should dispose men to leisure and privateness, and make men slothful ; it were a strange thing if that, which accustometh the mind to a perpetual motion and agitation, should induce slothfulness ; whereas contrariwise it may be truly affirmed, that no kind of men love business for itself, but those that are learned : for other persons love it for profit ; as an hireling, that loves the work for the wages ; or for honour, as because it beareth them up in the eyes of men, and refresheth their reputations, which otherwise would wear ; or because it putteth them in mind of their fortune, and giveth them occasion to pleasure and displeasure ; or because it exerciseth some faculty wherein they take pride, and so entertaineth them in good humour and pleasing conceits towards themselves ; or because it advanceth any other their ends. So that, as it is said of untrue valours, that some men's valours are in the eyes of them that look on ; so such men's industries are in the eyes of others, or at least in regard of their own designments : only learned men love business, as an action according to nature, as agreeable to health of mind, as exercise is to health of body, taking pleasure in the action itself, and not in the purchase : so that of all men they are the most indefatigable, if it be towards any business which can hold or detain their mind

And if any man be laborious in reading and study, and yet idle in business and action, it groweth from some weakness of body, or softness of spirit ; such as Seneca speaketh of : "*Quidam tam sunt umbratiles, ut putent in turbido esse, quicquid in luce est ;*" and not of learning : well may it be, that such a point of a man's nature may make him give himself to learning, but it is not learning that breedeth any such point in his nature.

And that learning should take up too much time or leisure : I answer ; the most active or busy man, that hath been or can be, hath, no question, many vacant times of leisure, while he expecteth the tides and returns of business (except he be either tedious and of no dispatch, or lightly and unworthily ambitious to meddle in things that may be better done by others :) and then the question is but, how those spaces and times of leisure shall be filled and spent ; whether in pleasures, or in studies ; as was well answered by Demosthenes to his adversary *Æschines*, that was a man given to pleasure, and told him, "that his orations did smell of the lamp : " "*Indeed,*" said Demosthenes, "*there is a great difference between the things that you and I do by lamp-light.*" So as no man need doubt, that learning will expulse business, but rather it will keep and defend the possession of the mind against idleness and pleasure ; which otherwise, at unawares, may enter to the prejudice of both.

Again, for that other conceit, that learning should undermine the reverence of laws and government, it is assuredly a mere depravation and calumny, without all shadow of truth. For to say, that a blind custom of obedience should be a surer obligation, than duty taught and understood ; it is to affirm, that a blind man may tread surer by a guide, than a seeing man can by a light. And it is without all

controversy, that learning doth make the minds of men gentle, generous, maniable, and pliant to government; whereas ignorance makes them churlish, thwarting, and mutinous; and the evidence of time doth clear this assertion, considering that the most barbarous, rude, and unlearned times, have been most subject to tumults, seditions, and changes.

And as to the judgment of Cato the Censor, he was well punished for his blasphemy against learning, in the same kind wherein he offended; for when he was past threescore years old, he was taken with an extreme desire to go to school again, and to learn the Greek tongue, to the end to peruse the Greek authors, which doth well demonstrate, that his former censure of the Grecian learning was rather an affected gravity, than according to the inward sense of his own opinion. And as for Virgil's verses, though it pleased him to brave the world, in taking to the Romans the art of empire, and leaving to others the arts of subjects; yet so much is manifest, that the Romans never ascended to that height of empire, till the time they had ascended to the height of other arts. For in the time of the two first Cæsars, which had the art of government in greatest perfection, there lived the best poet, Virgilius Maro; the best historiographer, Titus Livius; the best antiquary, Marcus Varro; and the best or second orator, Marcus Cicero, that to the memory of man are known. As for the accusation of Socrates, the time must be remembered when it was prosecuted; which was under the thirty tyrants, the most base, bloody, and envious persons that have governed; which revolution of state was no sooner over, but Socrates, whom they had made a person criminal, was made a person heroical, and his memory accumulate with honours divine and human; and those discourses of his, which were then termed corrupting of manners, were after acknowledged for sovereign medicines of the mind and manners, and so have been received ever since, till this day. Let this therefore serve for answer to politicians, which, in their humorous severity, or in their feigned gravity, have presumed to throw imputations upon learning; which redargution, nevertheless, (save that we know not whether our labours may extend to other ages) were not needful for the present, in regard of the love and reverence towards learning, which the example and countenance of two so learned princes, Queen Elizabeth and your majesty, being as Castor and Pollux, *lucida sidera*, stars of excellent light and most benign influence, hath wrought in all men of place and authority in our nation.

Now therefore we come to that third sort of discredit, or diminution of credit, that groweth unto learning from learned men themselves, which commonly cleaveth fastest: it is either from their fortune, or from their manners, or from the nature of their studies. For the first, it is not in their power; and the second is accidental; the third only is proper to be handled: but because we are not in hand with true measure, but with popular estimation and conceit, it is not amiss to speak somewhat of the two former. The derogations, therefore, which grow to learning from the fortune or condition of

learned men, are either in respect of scarcity of means, or in respect of privateness of life, and meanness of employments.

Concerning want, and that it is the case of learned men usually to begin with little, and not to grow rich so fast as other men, by reason they convert not their labours chiefly to lucre and increase : It were good to leave the common place in commendation of some friar to handle, to whom much was attributed by Machiavel in this point ; when he said, " that the kingdom of the clergy had been long before at an end, if the reputation, and reverence towards the poverty of friars had not borne out the scandal of the superfluities and excesses of bishops and prelates." So a man might say, that the felicity and delicacy of princes and great persons had long since turned to rudeness and barbarism, if the poverty of learning had not kept up civility and honour of life : but, without any such advantages, it is worthy the observation, what a reverend and honoured thing poverty of fortune was, for some ages, in the Roman state, which nevertheless was a state without paradoxes ; for we see what Titus Livius saith in his introduction : "*Cæterum aut me amor negotii suscepti fallit, aut nulla unquam respublica nec major, nec sanctior, nec bonis exemplis ditior fuit ; nec in quam tam seræ avaritia luxuriaque immigraverint ; nec ubi tantus ac tam diu paupertati ac parsimonie honos fuerit.*" We see likewise, after that the state of Rome was not itself, but did degenerate, how that person, that took upon him to be counsellor to Julius Cæsar, after his victory, where to begin his restoration of the state, maketh it of all points the most summary to take away the estimation of wealth : "*Verum hæc et omnia mala pariter cum honore pecunie desinent, si neque magistratus, neque alia vulgo cupienda, venalia erunt.*" To conclude this point, as it was truly said, that "*rubor est virtutis color,*" though sometimes it comes from vice : so it may be fitly said, that "*paupertas est virtutis fortuna ;*" though sometimes it may proceed from misgovernment and accident. Surely Solomon hath pronounced it both in censure, "*Qui festinat ad divitias, non erit insons ;*" and in precept ; "*Buy the truth and sell it not ;*" and so of wisdom and knowledge ; judging that means were to be spent upon learning, and not learning to be applied to means. And as for the privateness, or obscureness (as it may be in vulgar estimation accounted) of life of contemplative men ; it is a theme so common, to extol a private life, not taxed with sensuality and sloth, in comparison, and to the disadvantage of a civil life, for safety, liberty, pleasure, and dignity, or at least freedom from indignity, as no man handleth it, but handleth it well : such a consonancy it hath to men's conceits in the expressing, and to men's consents in the allowing. This only I will add, that learned men, forgotten in states, and not living in the eyes of men, are like the images of Cassius and Brutus in the funeral of Junia ; of which not being represented, as many others were, Tacitus saith, "*Eo ipso præfulgebant, quod non visebantur.*"

And for the meanness of employment, that which is most traduced to contempt, is, that the government of youth is commonly allotted to

them ; which age, because it is the age of least authority, it is transferred to the disesteeming of those employments wherein youth is conversant, and which are conversant about youth. But how unjust this traducement is (if you will reduce things from popularity of opinion to measure of reason) may appear in that we see men are more curious what they put into a new vessel, than into a vessel seasoned ; and what mould they lay about a young plant, than about a plant corroborate ; so as the weakest terms and times of all things use to have the best applications and helps. And will you hearken to the Hebrew Rabbins ? “ Your young men shall see visions, and your old men shall dream dreams ; ” say they, youth is the worthier age, for that visions are nearer apparitions of God than dreams. And let it be noted, that howsoever the condition of life of pedants hath been scorned upon theatres, as the ape of tyranny ; and that the modern looseness or negligence hath taken no due regard to the choice of schoolmasters and tutors ; yet the ancient wisdom of the best times did always make a just complaint, that states were too busy with their laws, and too negligent in point of education : which excellent part of ancient discipline hath been in some sort revived, of late times, by the colleges of the Jesuits ; of whom, although in regard of their superstition I may say “ quo meliores, eo deteriores ; ” yet in regard of this, and some other points concerning human learning and moral matters, I may say, as Agesilaus said to his enemy Pharnabazus, “ Talis quum sis, utinam noster esses. ” And thus much touching the discredits drawn from the fortunes of learned men.

As touching the manners of learned men, it is a thing personal and individual : and no doubt there be amongst them, as in other professions, of all temperatures ; but yet so as it is not without truth, which is said, that “ abeunt studia in mores, ” studies have an influence and operation upon the manners of those that are conversant in them.

But upon an attentive and indifferent review, I, for my part, cannot find any disgrace to learning can proceed from the manners of learned men not inherent to them as they are learned ; except it be a fault (which was the supposed fault of Demosthenes, Cicero, Cato the second, Seneca, and many more) that, because the times they read of are commonly better than the times they live in, and the duties taught better than the duties practised, they contend sometimes too far to bring things to perfection, and to reduce the corruption of manners to honesty of precepts, or examples of too great height. And yet hercof they have caveats enough in their own walks. For Solon, when he was asked whether he had given his citizens the best laws, answered wisely, “ Yea, of such as they would receive : ” And Plato, finding that his own heart could not agree with the corrupt manners of his country, refused to bear place or office ; saying, “ That a man’s country was to be used as his parents were, that is, with humble persuasions, and not with contestations. ” And Cæsar’s counsellor put in the same caveat, “ Non ad vetera instituta revocans, quæ jampridem corruptis moribus ludibrio sunt : ” and Cicero noted this error directly in Cato the second, when he writes to his friend Atticus : “ Cato optime sentit, sed nocet

interdum reipublicæ ; loquitur enim tanquam in republica Platonis, non tanquam in fœce Romuli." And the same Cicero doth excuse and expound the philosophers for going too far, and being too exact in their prescripts, when he saith, "*Isti ipsi præceptores virtutis et magistri videntur fines officiorum paulo longius, quam natura vellet, protulisse, ut cum ad ultimum animo contendissemus, ibi tamen, ubi oportet consistere :*" and yet himself might have said, "*Monitis sum minor ipse meis ;*" for it was his own fault, though not in so extreme a degree.

Another fault likewise much of this kind hath been incident to learned men ; which is, that they have esteemed the preservation, good, and honour of their countries or masters, before their own fortunes or safeties. For so saith Demosthenes unto the Athenians : " If it please you to note it, my counsels unto you are not such, whereby I should grow great amongst you, and you become little amongst the Grecians : but they be of that nature, as they are sometimes not good for me to give, but are always good for you to follow." And so Seneca, after he had consecrated that *Quinquennium Neronis* to the eternal glory of learned governors, held on his honest and loyal course of good and free counsel, after his master grew extremely corrupt in his government. Neither can this point otherwise be ; for learning endueth men's minds with a true sense of the frailty of their persons, the casualty of their fortunes, and the dignity of their soul and vocation : so that it is impossible for them to esteem that any greatness of their own fortune can be a true or worthy end of their being and ordainment ; and therefore are desirous to give their account to God, and so likewise to their masters under God (as kings and the states that they serve) in these words ; "*Ecce tibi lucrifeci,*" and not "*Ecce mihi lucrifeci :*" whereas the corrupter sort of mere politicians, that have not their thoughts established by learning in the love and apprehension of duty, nor ever look abroad into universality, do refer all things to themselves, and thrust themselves into the centre of the world, as if all lines should meet in them and their fortunes ; never caring, in all tempests, what becomes of the ship of state, so they may save themselves in the cock-boat of their own fortune ; whereas men that feel the weight of duty, and know the limits of self-love, use to make good their places and duties, though with peril. And if they stand in seditious and violent alterations, it is rather the reverence which many times both adverse parts do give to honesty, than any versatile advantage of their own carriage. But for this point of tender sense, and fast obligation of duty, which learning doth endue the mind withal, howsoever fortune may tax it, and many in the depth of their corrupt principles may despise it, yet it will receive an open allowance, and therefore needs the less disproof or excusation.

Another fault incident commonly to learned men, which may be more probably defended than truly denied, is, that they fail sometimes in applying themselves to particular persons : which want of exact application ariseth from two causes ; the one, because the largeness of their mind can hardly confine itself to dwell in the exquisite observation

or examination of the nature and customs of one person : for it is a speech for a lover, and not for a wise man : "*Satis magnum alter alteri theatrum sumus.*" Nevertheless I shall yield, that he that cannot contract the sight of his mind, as well as disperse and dilate it, wanteth great faculty. But there is a second cause, which is no inability, but a rejection upon choice and judgment : for the honest and just bounds of observation, by one person upon another, extend no farther, but to understand him sufficiently, whereby not to give him offence, or whereby to be able to give him faithful counsel, or whereby to stand upon reasonable guard and caution, in respect of a man's self. But to be speculative into another man, to the end to know how to work him, or wind him, or govern him, proceedeth from a heart that is double and cloven, and not entire and ingenuous ; which, as in friendship, it is want of integrity, so towards princes or superiors, is want of duty. For the custom of the Levant, which is, that subjects do forbear to gaze or fix their eyes upon princes, is in the outward ceremony barbarous, but the moral is good : for men ought not, by cunning and bent observations, to pierce and penetrate into the hearts of kings, which the Scripture hath declared to be inscrutable.

There is yet another fault (with which I will conclude this part) which is often noted in learned men, that they do many times fail to observe decency and discretion in their behaviour and carriage, and commit errors in small and ordinary points of actions, so as the vulgar sort of capacities do make a judgment of them in greater matters, by that which they find wanting in them in smaller. But this consequence doth often deceive men, for which I do refer them over to that which was said by Themistocles, arrogantly and uncivilly, being applied to himself out of his own mouth ; but, being applied to the general state of this question, pertinently and justly ; when being invited to touch a lute, he said, "He could not fiddle, but he could make a small town a great state." So, no doubt, many may be well seen in the passages of government and policy, which are to seek in little and punctual occasions. I refer them also to that which Plato said of his master Socrates, whom he compared to the gallypots of apothecaries, which on the outside had apes and owls, and antiques, but contained within sovereign and precious liquors and confections ; acknowledging, that to an external report, he was not without superficial levities and deformities, but was inwardly replenished with excellent virtues and powers. And so much touching the point of manners of learned men.

But in the mean time I have no purpose to give allowance to some conditions and courses base and unworthy, wherein divers professors of learning have wronged themselves, and gone too far ; such as were those trencher philosophers, which in the latter age of the Roman state were usually in the houses of great persons, being little better than solemn parasites ; of which kind Lucian maketh a merry description of the philosopher that the great lady took to ride with her in her coach, and would needs have him carry her little dog, which he doing officiously, and yet uncomely, the page scoffed, and said, "That he

doubted, the philosopher of a Stoic would turn to be a Cynic." But above all the rest, the gross and palpable flattery, whereunto many, not unlearned, have abased and abused their wits and pens, turning, as Du Bartas saith, Hecuba into Helena, and Faustina into Lucretia, hath most diminished the price and estimation of learning. Neither is the modern dedications of books and writings, as to patrons, to be commended : for that books, such as are worthy the name of books, ought to have no patrons but truth and reason. And the ancient custom was, to dedicate them only to private and equal friends, or to intitle the books with their names ; or if to kings and great persons, it was to some such as the argument of the book was fit and proper for : but these and the like courses may deserve rather reprehension than defence.

Not that I can tax or condemn the morigeration or application of learned men to men in fortune. For the answer was good that Diogenes made to one that asked him in mockery, "How it came to pass that philosophers were the followers of rich men, and not rich men of philosophers?" He answered soberly, and yet sharply, "Because the one sort knew what they had need of, and the other did not." And of the like nature was the answer which Aristippus made, when having a petition to Dionysius, and no ear given to him, he fell down at his feet ; whereupon Dionysius staid, and gave him the hearing, and granted it ; and afterwards some person, tender on the behalf of philosophy, reproved Aristippus, that he would offer the profession of philosophy such an indignity, as for a private suit to fall at a tyrant's feet. But he answered, "It was not his fault, but it was the fault of Dionysius, that he had his ears in his feet." Neither was it accounted weakness, but discretion in him that would not dispute his best with Adrianus Cæsar ; excusing himself, "That it was reason to yield to him that commanded thirty legions." These and the like applications, and stooping to points of necessity and convenience, cannot be disallowed : for though they may have some outward baseness, yet in a judgment truly made, they are to be accounted submissions to the occasion, and not to the person.

Now I proceed to those errors and vanities, which have intervened amongst the studies themselves of the learned, which is that which is principal and proper to the present argument ; wherein my purpose is not to make justification of the errors, but, by a censure and separation of the errors, to make a justification of that which is good and sound, and to deliver that from the aspersion of the other. For we see, that it is the manner of men to scandalize and deprave that which retaineth the state and virtue, by taking advantage upon that which is corrupt and degenerate ; as the heathens in the primitive Church used to blemish and taint the Christians with the faults and corruptions of heretics. But nevertheless I have no meaning at this time to make any exact animadversion of the errors and impediments in matters of learning, which are more secret and remote from vulgar opinion, but only to speak unto such as do fall under, or near unto, a popular observation.

➤ There be therefore three vanities in studies, whereby learning hath been most traduced. For those things we do esteem vain, which are either false or frivolous, those which either have no truth, or no use : and those persons we esteem vain, which are either credulous or curious ; and curiosity is either in matter, or words : so that in reason, as well as in experience, there fall out to be these three distempers, as I may term them, of learning : the first, fantastical learning ; the second, contentious learning : and the last delicate learning ; vain imaginations, vain altercations, and vain affectations ; and with the last I will begin.

Martin Luther, conducted no doubt by an higher providence, but in discourse of reason, finding what a province he had undertaken against the bishop of Rome, and the degenerate traditions of the church, and finding his own solitude being no ways aided by the opinion of his own time, was enforced to awake all antiquity, and to call former times to his succour, to make a party against the present time. So that the ancient authors, both in divinity, and in humanity, which had long time slept in libraries, began generally to be read and revolved. This by consequence did draw on a necessity of a more exquisite travel in the languages original, wherein those authors did write, for the better understanding of those authors, and the better advantage of pressing and applying their words. And thereof grew again a delight in their manner and style of phrase, and an admiration of that kind of writing ; which was much furthered and precipitated by the enmity of opposition, that the propounders of those primitive, but seeming new, opinions had against the schoolmen, who were generally of the contrary part, and whose writings were altogether of a differing style and form ; taking liberty to coin, and frame new forms of art to express their own sense, and to avoid circuit of speech, without regard to the pureness, pleasantness, and, as I may call it, lawfulness of the phrase or word. And again, because the great labour then was with the people, of whom the Pharisees were wont to say, “*Execrabilis ista turba, quæ non novit legem* ;” for the winning and persuading of them, there grew of necessity in chief price and request, eloquence and variety of discourse, as the fittest and forciblest access into the capacity of the vulgar sort : so that these four causes concurring, the admiration of ancient authors, the hate of the schoolmen, the exact study of languages, and the efficacy of preaching, did bring in an affectionate study of eloquence, and *copia* of speech, which then began to flourish. This grew speedily into an excess : for men began to hunt more after words than matter ; and more after the choiceness of the phrase, and the round and clean composition of the sentence, and the sweet falling of the clauses, and the varying and illustration of their works with tropes and figures, than after the weight of matter, worth of subject, soundness of argument, life of invention, or depth of judgment. Then grew the flowing and watery vein of Osorius, the Portugal bishop, to be in price. Then did Sturmius spend such infinite and curious pains upon Cicero the orator, and Hermogenes the rhetorican, besides his own books of the periods, and imitation, and the like. Then did Car of

Cambridge, and Ascham, with their lectures and writings, almost deify Cicero and Demosthenes, and allure all young men, that were studious, unto that delicate and polished kind of learning. Then did Erasmus take occasion to make the scoffing echo: "*Decem annos consumpsi in legendo Cicerone:*" and the echo answered in Greek *Ὀὐε, Ασινε*. Then grew the learning of the schoolmen to be utterly despised as barbarous. In sum, the whole inclination and bent of those times was rather towards *copia*, than weight.

Here therefore is the first distemper of learning, when men study words and not matter: whereof though I have represented an example of late times, yet it hath been, and will be *secundum majus et minus* in all time. And how is it possible but this should have an operation to discredit learning, even with vulgar capacities, when they see learned men's works like the first letter of a patent, or limned book; which though it hath large flourishes, yet it is but a letter? It seems to me that Pygmalion's frenzy is a good emblem or portraiture of this vanity; for words are but the images of matter, and except they have life of reason and invention, to fall in love with them is all one as to fall in love with a picture.

But yet, notwithstanding, it is a thing not hastily to be condemned, to clothe and adorn the obscurity, even of philosophy itself, with sensible and plausible elocution. For hercof we have great examples in Xenophon, Cicero, Seneca, Plutarch, and of Plato also in some degree; and hercof likewise there is great use; for surely, to the severe inquisition of truth, and the deep progress into philosophy, it is some hindrance; because it is too early satisfactory to the mind of man, and quencheth the desire of farther search, before we come to a just period; but then, if a man be to have any use of such knowledge in civil occasions, of conference, counsel, persuasion, discourse or the like; then shall he find it prepared to his hands in those authors which write in that manner. But the excess of this is so justly contemptible, that as Hercules, when he saw the image of Adonis, Venus's minion, in a temple, said in disdain, "*Nil sacri es;*" so there is none of Hercules's followers in learning, that is, the more severe and laborious sort of inquirers into truth, but will despise those delicacies and affectations, as indeed capable of no divineness. And thus much of the first disease or distemper of learning.

The second, which followeth, is in nature worse than the former: for as substance of matter is better than beauty of words, so, contrariwise, vain matter is worse than vain words; wherein it seemeth the reprehension of St. Paul was not only proper for those times, but propheticall for the times following; and not only respective to divinity, but extensive to all knowledge: "*Devita profanas vocum novitates, et oppositiones falsi nominis scientiæ.*" For he assigneth two marks and badges of suspected and falsified science: the one, the novelty and strangeness of terms; the other, the strictness of positions, which of necessity doth induce oppositions, and so questions and altercations. Surely, like as many substances in nature which are solid, do putrify and corrupt into worms; so it is the propriety of good and sound knowledge, to putrify

and dissolve into a number of subtle, idle, unwholesome, and, as I may term them, vermiculate questions, which have indeed a kind of quickness, and life of spirit, but no soundness of matter, or goodness of quality. This kind of degenerate learning did chiefly reign amongst the schoolmen, who, having sharp and strong wits, and abundance of leisure, and small variety of reading ; but their wits being shut up in the cells of a few authors, chiefly Aristotle their dictator, as their persons were shut up in the cells of monasteries and colleges, and knowing little history, either of nature or time, did, out of no great quantity of matter, and infinite agitation of wit, spin out unto us those laborious webs of learning, which are extant in their books. For the wit and mind of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff, and is limited thereby : but if it work upon itself, as the spider worketh his web, then it is endless, and brings forth indeed cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit.

This same unprofitable subtilty or curiosity is of two sorts ; either in the subject itself that they handle, when it is fruitless speculation or controversy, whereof there are no small number both of divinity and philosophy ; or in the manner or method of handling of a knowledge, which amongst them was this ; upon every particular position or assertion to frame objections, and to those objections, solutions ; which solutions were for the most part not confutations, but distinctions : whereas indeed the strength of all sciences is, as the strength of the old man's faggot, in the band. For the harmony of a science, supporting each part the other, is and ought to be the true and brief confutation and suppression of all the smaller sorts of objections. But, on the other side, if you take out every axiom, as the sticks of the faggot, one by one, you may quarrel with them and bend them, and break them at your pleasure : so that as was said of Seneca, "*Verborum minutiis rerum frangit pondera :*" so a man may truly say of the schoolmen, "*Quæstionum minutiis scientiarum frangunt soliditatem.*" For were it not better for a man in a fair room, to set up one great light, or branching candlestick of lights, than to go about with a small watch candle into every corner ? And such is their method, that rests not so much upon evidence of truth proved by arguments, authorities, similitudes, examples, as upon particular confutations and solutions of every scruple, cavillation, and objection ; breeding for the most part one question, as fast as it solveth another ; even as in the former resemblance, when you carry the light into one corner, you darken the rest : so that the fable and fiction of Scylla seemeth to be a lively image of this kind of philosophy or knowledge, which was transformed into a comely virgin for the upper parts ; but then, "*Candida succinctam latrantibus inguina monstris :*" so the generalities of the schoolmen are for a while good and proportionable ; but then, when you descend into their distinctions and decisions, instead of a fruitful womb, for the use and benefit of man's life, they end in monstrous altercations, and barking questions. So as it is not possible but this quality of knowledge must fall under popular contempt, the people being apt to con-

temn truth upon occasion of controversies and altercations, and to think they are all out of their way which never meet : and when they see such digladiation about subtilties, and matters of no use or moment, they easily fall upon that judgment of Dionysius of Syracusæ, "*Verba ista sunt senum otiosorum.*"

Notwithstanding, certain it is, that if those schoolmen, to their great thirst of truth, and unwearied travel of wit, had joined variety and universality of reading and contemplation, they had proved excellent lights, to the great advancement of all learning and knowledge ; but as they are, they are great undertakers indeed, and fierce with dark keeping. But as in the inquiry of the divine truth, their pride inclined to leave the oracle of God's word, and to vanish in the mixture of their own inventions ; so in the inquisition of nature, they ever left the oracle of God's works, and adored the deceiving and deformed images, which the unequal mirror of their own minds, or a few received authors or principles, did represent unto them. And thus much for the second disease of learning.

For the third vice or disease of learning, which concerneth deceit or untruth, it is of all the rest the foulest ; as that which doth destroy the essential form of knowledge ; which is nothing but a representation of truth ; for the truth of being, and the truth of knowing are one, differing no more than the direct beam, and the beam reflected. This vice therefore brancheth itself into two sorts ; delight in deceiving, and aptness to be deceived ; imposture and credulity ; which, although they appear to be of a diverse nature, the one seeming to proceed of cunning, and the other of simplicity ; yet certainly they do for the most part concur : for as the verse noteth,

"*Percontatorem fugito, nam garrulus idem est :*"

an inquisitive man is a prattler : so upon the like reason, a credulous man is a deceiver ; as we see it in fame, that he that will easily believe rumours, will as easily augment rumours, and add somewhat to them of his own ; which Tacitus wisely noteth, when he saith, "*Fingunt simul creduntque :*" so great an affinity hath fiction and belief.

This facility of credit, and accepting or admitting things weakly authorized or warranted, is of two kinds, according to the subject : for it is either a belief of history, or, as the lawyers speak, matter of fact ; or else of matter of art and opinion : as to the former, we see the experience and inconvenience of this error in ecclesiastical history, which hath too easily received and registered reports and narrations of miracles wrought by martyrs, hermits, or monks of the desert, and other holy men, and their relicks, shrines, chapels, and images ; which though they had a passage for a time, by the ignorance of the people, the superstitious simplicity of some, and the politic toleration of others, holding them but as divine poesies : yet after a period of time, when the mist began to clear up, they grew to be esteemed but as old wives fables, impostures of the clergy, illusions of spirits, and badges of antichrist, to the great scandal and detriment of religion.

So in natural history, we see there hath not been that choice and

judgment used as ought to have been, as may appear in the writings of Plinius, Cardanus, Albertus, and divers of the Arabians, being fraught with much fabulous matter, a great part not only untried, but notoriously untrue, to the great derogation of the credit of natural philosophy with the grave and sober kinds of wits : wherein the wisdom and integrity of Aristotle is worthy to be observed, that, having made so diligent and exquisite a history of living creatures, hath mingled it sparingly with any vain or feigned matter ; and yet, on the other side, hath cast all prodigious narrations, which he thought worthy the recording, into one book : excellently discerning that matter of manifest truth, such whereupon observation and rule was to be built, was not to be mingled or weakened with matter of doubtful credit ; and yet again, that rarities and reports, that seem incredible, are not to be suppressed or denied to the memory of men.

And as for the facility of credit which is yielded to arts and opinions, it is likewise of two kinds, either when too much belief is attributed to the arts themselves, or to certain authors in any art. The sciences themselves, which have had better intelligence and confederacy with the imagination of man, than with his reason, are three in number : astrology, natural magic, and alchemy ; of which sciences, nevertheless, the ends or pretences are noble. For astrology pretendeth to discover that correspondence, or concatenation, which is between the superior globe and the inferior. Natural magic pretendeth to call and reduce natural philosophy from variety of speculations to the magnitude of works ; and alchemy pretendeth to make separation of all the unlike parts of bodies, which in mixtures of nature are incorporate. But the derivations and prosecutions to these ends, both in the theories and in the practices, are full of error and vanity ; which the great professors themselves have sought to veil over and conceal by enigmatical writings, and referring themselves to auricular traditions and such other devices, to save the credit of impostors : and yet surely to alchemy this right is due, that it may be compared to the husbandman whereof Æsop makes the fable ; that, when he died, told his sons, that he had left unto them gold buried under ground in his vineyard ; and they digged over all the ground, and gold they found none ; but by reason of their stirring and digging the mould about the roots of their vines, they had a great vintage the year following : so assuredly the search and stir to make gold hath brought to light a great number of good and fruitful inventions and experiments, as well for the disclosing of nature, as for the use of man's life.

And as for the overmuch credit that hath been given unto authors in sciences, in making them dictators, that their words should stand ; and not consuls to give advice ; the damage is infinite that sciences have received thereby, as the principal cause that hath kept them low, at a stay without growth or advancement. For hence it hath come, that in arts mechanical, the first deviser comes shortest, and time addeth and perfecteth : but in sciences, the first author goeth farthest, and time loseth and corrupteth. So we see, artillery, sailing, printing,

and the like, were grossly managed at the first, and by time accommodated and refined : but contrariwise the philosophies and sciences of Aristotle, Plato, Democritus, Hippocrates, Euclides, Archimedes, of most vigour at the first, and by time degenerate and embased ; whereof the reason is no other, but that in the former many wits and industries have contributed in one ; and in the latter, many wits and industries have been spent about the wit of some one, whom many times they have rather depraved than illustrated. For as water will not ascend higher than the level of the first spring-head from whence it descendeth, so knowledge derived from Aristotle, and exempted from liberty of examination, will not rise again higher than the knowledge of Aristotle. And therefore, although the position be good, "*Oportet discentem credere* ; " yet it must be coupled with this, "*Oportet edoctum judicare* : " for disciples do owe unto masters only a temporary belief, and a suspension of their own judgment till they be fully instructed, and not an absolute resignation, or perpetual captivity : and, therefore, to conclude this point, I will say no more ; but so let great authors have their due, as time, which is the author of authors, be not deprived of his due, which is, farther and farther to discover truth. Thus I have gone over these three diseases of learning ; besides the which, there are some other rather peccant humours than formed diseases, which nevertheless are not so secret and intrinsic, but that they fall under a popular observation and traducement, and therefore are not to be passed over.

The first of these is the extreme affecting of two extremities : the one antiquity, the other novelty ; wherein it seemeth the children of time do take after the nature and malice of the father. For as he devoureth his children, so one of them seeketh to devour and suppress the other, while antiquity envieth there should be new additions, and novelty cannot be content to add, but it must deface ; surely, the advice of the prophet is the true direction in this matter, "*State super vias antiquas, et videte quam sit via recta et bona, et ambulate in ea.*" Antiquity deserveth that reverence, that men should make a stand thereupon, and discover what is the best way ; but when the discovery is well taken, then to make progression. And to speak truly, "*Antiquitas seculi, juvenus mundi.*" These times are the ancient times, when the world is ancient, and not those which we account ancient *ordine retrogrado*, by a computation backward from ourselves.

Another error, induced by the former, is a distrust that anything should be now to be found out, which the world should have missed and passed over so long time ; as if the same objection were to be made to time, that Lucian maketh to Jupiter and other the heathen gods, of which he wondereth, that they begot so many children in old time, and begot none in his time ; and asketh, whether they were become septuagenary, or whether the law Papia, made against old men's marriages, had restrained them. So it seemeth men doubt, lest time is become past children and generation ; wherein, contrariwise, we see commonly the levity and unconstancy of men's

judgments, which, till a matter be done, wonder that it can be done ; and, as soon as it is done, wonder again that it was no sooner done ; as we see in the expedition of Alexander into Asia, which at first was prejudged as a vast and impossible enterprise : and yet afterwards it pleaseth Livy to make no more of it than this ; “ Nil aliud, quam bene ausus est vana contemnere : ” and the same happened to Columbus in the western navigation. But in intellectual matters, it is much more common ; as may be seen in most of the propositions of Euclid, which till they be demonstrated, they seem strange to our assent ; but being demonstrated, our mind accepteth of them by a kind of relation, as the lawyers speak, as if we had known them before.

Another error that hath also some affinity with the former, is a conceit, that of former opinions or sects, after variety and examination, the best hath still prevailed, and suppressed the rest : so as, if a man should begin the labour of a new search, he were but like to light upon somewhat formerly rejected, and by rejection brought into oblivion ; as if the multitude, or the wisest, for the multitude's sake, were not ready to give passage, rather to that which is popular and superficial, than to that which is substantial and profound : for the truth is, that time seemeth to be of the nature of a river or stream, which carrieth down to us that which is light and blown up, and sinketh and drowneth that which is weighty and solid.

Another error, of a diverse nature from all the former, is the over early and peremptory reduction of knowledge into arts and methods ; from which time, commonly, sciences receive small or no augmentation. But as young men, when they knit, and shape perfectly, do seldom grow to a farther stature : so knowledge, while it is in aphorisms and observations, it is in growth ; but when it once is comprehended in exact methods, it may perchance be farther polished and illustrated, and accommodated for use and practice ; but it increaseth no more in bulk and substance.

Another error which doth succeed that which we last mentioned, is, that after the distribution of particular arts and sciences, men have abandoned universality, or *philosophia prima* ; which cannot but cease, and stop all progression. For no perfect discovery can be made upon a flat or a level : neither is it possible to discover the more remote, and deeper parts of any science, if you stand but upon the level of the same science, and ascend not to a higher science.

Another error hath proceeded from too great a reverence, and a kind of adoration of the mind and understanding of man : by means whereof, men have withdrawn themselves too much from the contemplation of nature, and the observations of experience, and have tumbled up and down in their own reason and conceits. Upon these intellectualists, which are, notwithstanding, commonly taken for the most sublime and divine philosophers, Heraclitus gave a just censure, saying, “ Men sought truth in their own little worlds, and not in the great and common world ; ” for they disdain to spell, and so by degrees to read in the volume of God's works ; and contrariwise, by continual meditation and agitation of wit, do urge and as it were invoke their

own spirits to divine, and give oracles unto them, whereby they are deservedly deluded.

Another error that hath some connexion with this latter, is, that men have used to infect their meditations, opinions, and doctrines, with some conceits which they have most admired, or some sciences which they have most applied; and given all things else a tincture according to them, utterly untrue and improper. So hath Plato intermingled his philosophy with theology, and Aristotle with logic; and the second school of Plato, Proclus, and the rest, with the mathematics. For these were the arts which had a kind of primogeniture with them severally. So have the alchemists made a philosophy out of a few experiments of the furnace; and Gilbertus, our countryman, hath made a philosophy out of the observations of a loadstone. So Cicero, when reciting the several opinions of the nature of the soul, he found a musician, that held the soul was but a harmony, saith pleasantly, "*Hic ab arte sua non recessit*," etc. But of these conceits Aristotle speaketh seriously and wisely, when he saith, "*Qui respiciunt ad pauca, de facili pronuntiant*."

Another error is an impatience of doubt, and haste to assertion without due and mature suspension of judgment. For the two ways of contemplation are not unlike the two ways of action, commonly spoken of by the ancients: the one plain and smooth in the beginning, and in the end impassable; the other rough and troublesome in the entrance, but after a while fair and even: so it is in contemplation; if a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties.

Another error is in the manner of the tradition and delivery of knowledge, which is for the most part magistral and peremptory; and not ingenuous and faithful, in a sort, as may be soonest believed, and most easiliest examined. It is true, that in compendious treatises for practice, that form is not to be disallowed. But in the true handling of knowledge, men ought not to fall either, on the one side, into the vein of Velleius the Epicurean: "*Nil tam metuens, quam ne dubitare aliqua de re videretur*:" nor, on the other side, into Socrates his ironical doubting of all things; but to propound things sincerely, with more or less asseveration, as they stand in a man's own judgment proved more or less.

Other errors there are in the scope that men propound to themselves, whereunto they bend their endeavours: for whereas the more constant and devote kind of professors of any science ought to propound to themselves to make some additions to their science; they convert their labours to aspire to certain second prizes; as to be a profound interpreter or commentator; to be a sharp champion or defender; to be a methodical compounder or abridger; and so the patrimony of knowledge cometh to be sometimes improved, but seldom augmented.

But the greatest error of all the rest, is the mistaking or misplacing of the last or farthest end of knowledge: for men have entered into

a desire of learning and knowledge, sometimes upon a natural curiosity, and inquisitive appetite ; sometimes to entertain their minds with variety and delight ; sometimes for ornament and reputation ; and sometimes to enable them to victory of wit and contradiction ; and most times for lucre and profession ; and seldom sincerely to give a true account of their gift of reason, to the benefit and use of men : as if there were sought in knowledge a couch, whereupon to rest a searching and restless spirit ; or a terras, for a wandering and variable mind to walk up and down with a fair prospect ; or a tower of state, for a proud mind to raise itself upon ; or a fort or commanding ground, for strife and contention ; or a shop, for profit, or sale ; and not a rich storehouse, for the glory of the Creator, and the relief of man's estate. But this is that which will indeed dignify and exalt knowledge, if contemplation and action may be more nearly and straitly conjoined and united together than they have been ; a conjunction like unto that of the two highest planets, Saturn, the planet of rest and contemplation, and Jupiter, the planet of civil society and action. Howbeit, I do not mean, when I speak of use and action, that end before-mentioned of the applying of knowledge to lucre and profession ; for I am not ignorant how much that diverteth and interrupteth the prosecution and advancement of knowledge, like unto the golden ball thrown before Atalanta, which while she goeth aside and stoopeth to take up, the race is hindered ;

Declinat cursus, aurumque volubile tollit.

Neither is my meaning, as was spoken of Socrates, to call philosophy down from heaven to converse upon the earth : that is, to leave natural philosophy aside, and to apply knowledge only to manners and policy. But as both heaven and earth do conspire and contribute to the use and benefit of man ; so the end ought to be, from both philosophies to separate and reject vain speculations, and whatsoever is empty and void, and to preserve and augment whatsoever is solid and fruitful : that knowledge may not be, as a courtesan, for pleasure and vanity only, or, as a bond-woman, to acquire and gain to her master's use ; but, as a spouse, for generation, fruit, and comfort.

Thus have I described and opened, as by a kind of dissection, those peccant humours, the principal of them, which have not only given impediment to the proficience of learning, but have given also occasion to the traducement thereof : wherein if I have been too plain, it must be remembered, "*Fidelia vulnera amantis, sed dolosa oscula malignantis.*"

This, I think, I have gained, that I ought to be the better believed in that which I shall say pertaining to commendation ; because I have proceeded so freely in that which concerneth censure. And yet I have no purpose to enter into a laudative of learning, or to make a hymn to the Muses, though I am of opinion that it is long since their rites were duly celebrated : but my intent is, without varnish or amplification, justly to weigh the dignity of knowledge in the balance with

other things, and to take the true value thereof by testimonies and arguments divine and human.

First therefore, let us seek the dignity of knowledge in the archetype or first platform, which is the attributes and acts of God, as far as they are revealed to man, and may be observed with sobriety; wherein we may not seek it by the name of learning; for all learning is knowledge acquired, and all knowledge in God is original; and therefore we must look for it by another name, that of wisdom or sapience, as the Scriptures call it.

It is so then, that in the work of the creation we see a double emanation of virtue from God; the one referring more properly to power, the other to wisdom; the one expressed in making the subsistence of the matter, and the other in disposing the beauty of the form. This being supposed, it is to be observed, that, for anything which appeareth in the history of the creation, the confused mass and matter of heaven and earth was made in a moment; and the order and disposition of that chaos, or mass, was the work of six days; such a note of difference it pleased God to put upon the works of power, and the works of wisdom: wherewith concurrcth, that in the former it is not set down that God said, "Let there be heaven and earth," as it is set down of the works following; but actually, that God made heaven and earth: the one carrying the stile of a manufacture, and the other of a law, decree, or council.

To proceed to that which is next in order, from God to spirits. We find, as far as credit is to be given to the celestial hierarchy of that supposed Dionysius the senator of Athens, the first place or degree is given to the angels of love, which are termed Seraphim; the second to the angels of light, which are termed Cherubim; and third, and so following places, to thrones, principalities, and the rest, which are all angels of power and ministry; so as the angels of knowledge and illumination are placed before the angels of office and domination.

To descend from spirits and intellectual forms to sensible and material forms; we read the first form that was created was light, which hath a relation and correspondence in nature and corporal things to knowledge in spirits and incorporeal things.

So in the distribution of days, we see, the day wherein God did rest, and contemplate his own works, was blessed above all the days wherein he did effect and accomplish them.

After the creation was finished, it is set down unto us, that man was placed in the garden to work therein; which work, so appointed to him, could be no other than work of contemplation; that is, when the end of the work is but for exercise and experiment, not for necessity; for there being then no reluctance of the creature, nor sweat of the brow, man's employment must of consequence have been matter of delight in the experiment, and not matter of labour for the use. Again, the first acts which man performed in paradise, consisted of the two summary parts of knowledge; the view of creatures, and the imposition of names. As for the knowledge which induced the fall, it was, as was touched before, not the natural knowledge of creatures, but the moral know-

ledge of good and evil ; wherein the supposition was, that God's commandments or proaibitions were not the originals of good and evil, but that they had other beginnings, which man aspired to know, to the end to make a total defection from God, and to depend wholly upon himself.

To pass on : in the first event or occurrence after the fall of man, we see, as the Scriptures have infinite mysteries, not violating at all the truth of the story or letter, an image of the two estates, the contemplative state, and the active state, figured in the two persons of Abel and Cain, and in the two simplest and most primitive trades of life, that of the shepherd, who, by reason of his leisure, rest in a place, and living in view of heaven, is a lively image of a contemplative life ; and that of the husbandman ; where we see again the favour and election of God went to the shepherd, and not to the tiller of the ground.

So in the age before the flood, the holy records within those few memorials, which are there entered and registered, have vouchsafed mention, and honour the name of the inventors and authors of music, and works in metal. In the age after the flood, the first great judgment of God upon the ambition of man was the confusion of tongues ; whereby the open trade and intercourse of learning and knowledge was chiefly imbarred.

To descend to Moses thelawgiver, and God's first pen : he is adorned by the Scriptures with this addition and commendation, that he was "seen in all the learning of the Ægyptians ;" which nation, we know, was one of the most ancient schools of the world : for so Plato brings in the Ægyptian priest saying unto Solon, "You Grecians are ever children ; you have no knowledge of antiquity, nor antiquity of knowledge." Take a view of the ceremonial law of Moses ; you shall find, besides the prefiguration of Christ, the badge or difference of the people of God, the exercise and impression of obedience, and other divine uses and fruits thereof, that some of the most learned Rabbins have travelled profitably, and profoundly to observe, some of them a natural, some of them a moral sense, or reduction of many of the ceremonies and ordinances. As in the law of the leprosy, where it is said, "If the whiteness have overspread the flesh, the patient may pass abroad for clean ; but if there be any whole flesh remaining, he is to be shut up for unclean : " one of them noteth a principle of nature, that putrefaction is more contagious before maturity, than after : and another noteth a position of moral philosophy, that men, abandoned to vice, do not so much corrupt manners, as those that are half good and half evil. So in this, and very many other places in that law, there is to be found, besides the theological sense, much aspersion of philosophy.

So likewise in that excellent book of Job, if it be revolved with diligence, it will be found pregnant and swelling with natural philosophy ; as for example, cosmography and the roundness of the world : "*Qui extendit aquilonem super vacuum, et appendit terram super nihilum ;*" wherein the pensileness of the earth, the pole of the north, and the finiteneſs or convexity of heaven are manifestly touched. So again, matter of astronomy : "*Spiritus ejus ornavit cœlus, et obstetrican e*

manu ejus eductus est Coluber tortuosus." And in another place ; "Nonquid conjungere valebis micantes stellas Pleiadas, aut gyrum Arcturi poteris dissipare?" Where the fixing of the stars, ever standing at equal distance, is with great elegance noted. And in another place ; "Qui facit Arcturum, et Oriona, et Hyadas, et interiora Austri ;" where again he takes knowledge of the depression of the southern pole, calling it the secrets of the south, because the southern stars were in that climate unseen. Matter of generation, "Annon sicut lac mulsisti me, et sicut caseum coagulasti me," etc. Matter of minerals, "Habet argentum venarum suarum principia : et auro locus est in quo conilature, ferrum de terra tollitur, et lapis solutus calore in æs vertitur : " and so forwards in that chapter.

So likewise in the person of Solomon the king, we see the gift or endowment of wisdom and learning, both in Solomon's petition, and in God's assent thereunto, preferred before all other terrene and temporal felicity. By virtue of which grant or donative of God, Solomon became enabled, not only to write those excellent parables, or aphorisms, concerning divine and moral philosophy ; but also to compile a natural history of all verdure, from the cedar upon the mountain to the moss upon the wall, which is but a rudiment between putrefaction and an herb, and also of all things that breathe or move. Nay, the same Solomon the king, although he excelled in the glory of treasure and magnificent buildings, of shipping and navigation, of service and attendance, of fame and renown, and the like, yet he maketh no claim to any of those glories, but only to the glory of inquisition of truth ; for so he saith expressly, "The glory of God is to conceal a thing, but the glory of the king is to find it out ;" as if, according to the innocent play of children, the Divine Majesty took delight to hide his works, to the end to have them found out ; and as if kings could not obtain a greater honour than to be God's playfellows in that game, considering the great commandment of wits and means, whereby nothing needeth to be hidden from them.

Neither did the dispensation of God vary in the times after our Saviour came into the world ; for our Saviour himself did first show his power to subdue ignorance, by his conference with the priests and doctors of the law, before he showed his power to subdue nature by his miracles. And the coming of the Holy Spirit was chiefly figured and expressed in the similitude and gift of tongues, which are but *vehicula scientiæ*.

So in the election of those instruments, which it pleased God to use for the plantation of the faith, notwithstanding that at the first he did employ persons altogether unlearned, otherwise than by inspiration, more evidently to declare his immediate working, and to abase all human wisdom or knowledge ; yet, nevertheless, that counsel of his was no sooner performed, but in the next vicissitude and succession, he did send his divine truth into the world, waited on with other learnings, as with servants or handmaids : for so we see St. Paul, who was only learned among the apostles, had his pen most used in the Scriptures of the New Testament.

So again, we find that many of the ancient bishops and fathers of the Church were excellently read and studied in all the learning of the heathen ; insomuch, that the edict of the emperor Julianus, whereby it was interdicted unto Christians to be admitted into schools, lectures, or exercises of learning, was esteemed and accounted a more pernicious engine and machination against the Christian faith, than were all the sanguinary prosecutions of his predecessors ; neither could the emulation and jealousy of Gregory, the first of that name, bishop of Rome, ever obtain the opinion of piety or devotion ; but contrariwise received the censure of humour, malignity, and pusillanimity, even amongst holy men ; in that he designed to obliterate and extinguish the memory of heathen antiquity and authors. But contrariwise it was the Christian Church, which, amidst the inundations of the Scythians on the one side from the north-west, and the Saracens from the east, did preserve, in the sacred lap and bosom thereof, the precious relicks even of heathen learning, which otherwise had been extinguished, as if no such thing had ever been.

And we see before our eyes, that in the age of ourselves and our fathers, when it pleased God to call the church of Rome to account for their degenerate manners and ceremonies, and sundry doctrines obnoxious, and framed to uphold the same abuses : at one and the same time it was ordained by the divine providence, that there should attend withal a renovation, and new spring of all other knowledges : and, on the other side, we see the Jesuits, who partly in themselves, and partly by the emulation and provocation of their example, have much quickened and strengthened the state of learning ; we see, I say, what notable service and reparation they have done to the Roman see.

Wherefore, to conclude this part, let it be observed, that there be two principal duties and services, besides ornament and illustration, which philosophy and human learning do perform to faith and religion. The one, because they are an effectual inducement to the exaltation of the glory of God. For as the Psalms and other Scriptures do often invite us to consider, and magnify the great and wonderful works of God : so if we should rest only in the contemplation of the exterior of them, as they first offer themselves to our senses, we should do a like injury unto the majesty of God, as if we should judge or construe of the store of some excellent jeweller, by that only which is set out towards the street in his shop. The other, because they minister a singular help and preservative against unbelief and error ; for our Saviour saith, " You err, not knowing the Scriptures, nor the power of God ;" laying before us two books or volumes to study, if we will be secured from error ; first, the Scriptures, revealing the will of God ; and then the creatures, expressing his power : whereof the latter is a key unto the former : not only opening our understanding to conceive the true sense of the Scriptures, by the general notions of reason and rules of speech ; but chiefly opening our belief, in drawing us into a due meditation of the omnipotency of God, which is chiefly signed and engraven upon his works. Thus much therefore for divine testimony and evidence, concerning the true dignity and value of learning.

As for human proofs, it is so large a field, as, in a discourse of this nature and brevity, it is fit rather to use choice of those things which we shall produce, than to embrace the variety of them. First, therefore, in the degrees of human honour amongst the heathen, it was the highest, to obtain to a veneration and adoration as a God. This unto the Christians is as the forbidden fruit. But we speak now separately of human testimony ; according to which, that which the Grecians call "apotheosis," and the Latins, "relatio inter divos," was the supreme honour which man could attribute unto man ; especially when it was given, not by a formal decree or act of state, as it was used among the Roman Emperors, but by an inward assent and belief. Which honour being so high had also a degree or middle term ; for there were reckoned above human honours, honours heroical and divine : in the attribution and distribution of which honours, we see antiquity made this difference : that whereas founders and uniters of states and cities, lawgivers, extirpers of tyrants, fathers of the people, and other eminent persons in civil merit, were honoured but with the titles of worthies or demigods, such as were Hercules, Theseus, Minos, Romulus, and the like : on the other side, such as were inventors and authors of new arts, endowments and commodities towards man's life, were ever consecrated amongst the gods themselves : as were Ceres, Bacchus, Mercurius, Apollo, and others ; and justly : for the merit of the former is confined within the circle of an age or a nation ; and is like fruitful showers, which though they be profitable and good, yet serve but for that season, and for a latitude of ground where they fall ; but the other is indeed like the benefits of heaven, which are permanent and universal. The former, again, is mixed with strife and perturbation ; but the latter hath the true character of divine presence, coming in *aura leni*, without noise or agitation.

Neither is certainly that other merit of learning, in repressing the inconveniencies which grow from man to man, much inferior to the former, of relieving the necessities which arise from nature ; which merit was lively set forth by the ancients in that feigned relation of Orpheus's theatre, where all beasts and birds assembled, and forgetting their several appetites, some of prey, some of game, some of quarrel, stood all sociably together, listening to the airs and accords of the harp ; the sound whereof no sooner ceased, or was drowned by some louder noise, but every beast returned to his own nature : wherein is aptly described the nature and condition of men, who are full of savage and unreclaimed desires of profit, of lust, of revenge ; which as long as they give ear to precepts, to laws, to religion, sweetly touched with eloquence and persuasion of books, of sermons, of harangues, so long is society and peace maintained ; but if these instruments be silent, or that sedition and tumult make them not audible, all things dissolve into anarchy and confusion.

But this appeareth more manifestly, when kings themselves, or persons of authority under them, or other governors in commonwealths and popular estates, are endued with learning. For although he might be thought partial to his own profession, that said, "Then should

people and estates be happy, when either kings were philosophers, or philosophers kings ;" yet so much is verified by experience, that under wise and learned princes and governors there have been ever the best times : for howsoever kings may have their imperfections in their passions and customs ; yet if they be illuminate by learning, they have those notions of religion, policy, and morality, which do preserve them ; and refrain them from all ruinous and peremptory errors and excesses, whispering evermore in their ears, when counsellors and servants stand mute and silent. And senators, or counsellors likewise, which be learned, do proceed upon more safe and substantial principles, than counsellors which are only men of experience ; the one sort keeping dangers afar off, whereas the other them discover not till they come near hand, and then trust to the agility of their wit to ward or avoid them.

Which felicity of times under learned princes, to keep still the law of brevity, by using the most eminent and selected examples, doth best appear in the age which passed from the death of Domitianus the emperor, until the reign of Commodus ; comprehending a succession of six princes, all learned, or singular favourers and advancers of learning ; which age, for temporal respects, was the most happy and flourishing that ever the Roman empire, which then was a model of the world, enjoyed ; a matter revealed and prefigured unto Domitian in a dream the night before he was slain ; for he thought there was grown behind upon his shoulders a neck and a head of gold ; which came accordingly to pass in those golden times which succeeded ; of which princes we will make some commemoration : wherein although the matter will be vulgar, and may be thought fitter for a declamation, than agreeable to a treatise enfolded as this is ; yet because it is pertinent to the point in hand, "*neque semper arcum tendit Apollo,*" and to name them only were too naked and cursory, I will not omit it altogether.

The first was Nerva, the excellent temper of whose government, is by a glance in Cornelius Tacitus touched to the life : "*Postquam divus Nerva res olim insociabiles miscuisset, imperium et libertatem.*" And in token of his learning, the last act of his short reign, left to memory, was a missive to his adopted son Trajan, proceeding upon some inward discontent at the ingratitude of the times, comprehended in a verse of Homer's.

Telis, Phœbe, tuis lacrymas ulciscere nostras.

Trajan, who succeeded, was for his person not learned : but if we will hearken to the speech of our Saviour, that saith, "He that receiveth a prophet in the name of a prophet, shall have a prophet's reward," he deserveth to be placed amongst the most learned princes ; for there was not a greater admirer of learning, or benefactor of learning ; a founder of famous libraries, a perpetual advancer of learned men to office, and a familiar converser with learned professors and preceptors, who were noted to have then most credit in court. On the other side, how much Trajan's virtue and government was admired and renowned, surely no testimony of grave and faithful

history doth more lively set forth, than that legend tale of Gregorius Magnus, bishop of Rome, who was noted for the extreme envy he bore towards all heathen excellency ; and yet he is reported, out of the love and estimation of Trajan's moral virtues, to have made unto God passionate and fervent prayers for the delivery of his soul out of hell ; and to have obtained it, with a caveat, that he should make no more such petitions. In this prince's time also, the persecutions against the Christians received intermission, upon the certificate of Tlinius Secundus, a man of excellent learning, and by Trajan advanced.

Adrian, his successor, was the most curious man that lived, and the most universal inquirer ; insomuch as it was noted for an error in his mind, that he desired to comprehend all things, and not to reserve himself for the worthiest things ; falling into the like humour that was long before noted in Philip of Macedon, who, when he would needs over-rule and put down an excellent musician, in an argument touching music, was well answered by him again, " God forbid, Sir," saith he, " that your fortune should be so bad, as to know these things better than I." It pleased God likewise to use the curiosity of this emperor, as an inducement to the peace of his Church in those days. For having Christ in veneration, not as a God or Saviour, but as a wonder or novelty ; and having his picture in his gallery, matched with Apollonius, with whom, in his vain imagination, he thought he had some conformity, yet it served the turn to allay the bitter hatred of those times against the Christian name, so as the Church had peace during his time. And for his government civil, although he did not attain to that of Trajan's, in the glory of arms, or perfection of justice, yet in deserving of the weal of the subject he did exceed him. For Trajan erected many famous monuments and buildings, insomuch as Constantine the Great in emulation was wont to call him "*Parietaria*," wall-flower, because his name was upon so many walls : but his buildings and works were more of glory and triumph than use and necessity. But Adrian spent his whole reign, which was peaceable, in a perambulation, or survey of the Roman empire, giving order, and making assignation where he went, for re-edifying of cities, towns, and forts decayed, and for cutting of rivers and streams, and for making bridges and passages, and for policying of cities and commonalties with new ordinances and constitutions, and granting new franchises and incorporations ; so that his whole time was a very restauration of all the lapses and decays of former times.

Antoninus Pius, who succeeded him, was a prince excellently learned ; and had the patient and subtle wit of a schoolman ; insomuch as in common speech, which leaves no virtue untaxed, he was called "*Cymini sector*," a carver, or a divider of cumin seed, which is one of the least seeds ; such a patience he had and settled spirit, to enter into the least and most exact difference of causes, a fruit no doubt of the exceeding tranquillity and serenity of his mind ; which being no ways charged or encumbered, either with fears, remorse, or scruples, but having been noted for a man of the purest goodness, without all fiction or affectation, that hath reigned or lived, made his

mind continually present and entire. He likewise approached a degree nearer unto Christianity, and became, as Agrippa said unto St. Paul, "half a Christian;" holding their religion and law in good opinion, and not only ceasing persecution, but giving way to the advancement of Christians.

There succeeded him the first *divi fratres*, the two adoptive brethren, Lucius Commodus Verus, son to Ælius Verus, who delighted much in the softer kind of learning, and was wont to call the poet Martial his Virgil: and Marcus Aurelius Antoninus, whereof the latter, who obscured his colleague, and survived him long, was named the philosopher; who, as he excelled all the rest in learning, so he excelled them likewise in perfection of all royal virtues; insomuch as Julianus the emperor, in his book, intitled "Cæsares," being as a pasquil or satire to deride all his predecessors, feigned, that they were all invited to a banquet of the gods, and Silenus the jester sat at the nether end of the table, and bestowed a scoff on every one as they came in; but when Marcus Philosophus came in, Silenus was gravelled, and out of countenance, not knowing where to carp at him, save at the last he gave a glance at his patience towards his wife. And the virtue of this prince, continued with that of his predecessor, made the name of Antoninus so sacred in the world, that though it were extremely dishonoured in Commodus, Caracalla, and Helio-gabalus, who all bore the name; yet when Alexander Severus refused the name, because he was a stranger to the family, the Senate with one acclamation said, "*Quo modo Augustus, sic et Antoninus.*" In such renown and veneration was the name of these two princes in those days, that they would have had it as a perpetual addition in all the emperor's stile. In this emperor's time also, the Church for the most part was in peace; so as in this sequence of six princes, we do see the blessed effects of learning in sovereignty, painted forth in the greatest table of the world.

But for a tablet, or picture of smaller volume, not presuming to speak of your majesty that liveth, in my judgment, the most excellent is that of Queen Elizabeth, your immediate predecessor in this part of Britain; a princess that if Plutarch were now alive to write lives by parallels, would trouble him, I think to find for her a parallel amongst women. This lady was endued with learning in her sex singular, and rare even amongst masculine princes; whether we speak of learning of language, or of science, modern or ancient, divinity or humanity: and unto the very last year of her life, she accustomed to appoint set hours for reading; scarcely any young student in an university, more daily, or more duly. As for her government, I assure myself, I shall not exceed, if I do affirm, that this part of the island never had forty-five years of better times; and yet not through the calmness of the season, but through the wisdom of her regiment.

For if there be considered, of the one side, the truth of religion established; the constant peace and security; the good administration of justice; the temperate use of the prerogative, not slackened, nor much strained; the flourishing state of learning, sortable to so excel-

lent a patroness ; the convenient estate of wealth and means, both of crown and subject ; the habit of obedience, and the moderation of discontents ; and there be considered, on the other side, the differences of religion, the troubles of neighbour countries, the ambition of Spain, and opposition of Rome : and then, that she was solitary, and of herself : these things, I say, considered ; as I could not have chosen an instance so recent and so proper, so, I suppose, I could not have chosen one more remarkable, or eminent, to the purpose now in hand, which is concerning the conjunction of learning in the prince, with felicity in the people.

Neither hath learning an influence and operation only upon civil merit and moral virtue, and the arts or temperature of peace and peaceable government ; but likewise it hath no less power and efficacy in enablement towards martial and military virtue and prowess ; as may be notably represented in the examples of Alexander the great, and Cæsar the dictator, mentioned before, but now in fit place to be resumed ; of whose virtues and acts in war there needs no note or recital, having been the wonders of time in that kind : but of their affections towards learning, and perfections in learning, it is pertinent to say somewhat.

Alexander was bred and taught under Aristotle the great philosopher, who dedicated divers of his books of philosophy unto him : he was attended by Callisthenes, and divers other learned persons, that followed him in camp, throughout his journeys and conquests. What price and estimation he had learning in, doth notably appear in these three particulars : first, in the envy he used to express that he bore towards Achilles, in this, that he had so good a trumpet of his praises as Homer's verses : secondly, in the judgment or solution he gave touching that precious cabinet of Darius, which was found amongst his jewels, whereof question was made as to what thing was worthy to be put into it, and he gave his opinion for Homer's works : thirdly, in his letter to Aristotle, after he had set forth his books of nature, wherein he expostulateth with him for publishing the secrets or mysteries of philosophy, and gave him to understand that himself esteemed it more to excel other men in learning and knowledge, than in power and empire. And what use he had of learning doth appear, or rather shine, in all his speeches and answers, being full of science and use of science, and that in all variety.

And here again it may seem a thing scholastical, and somewhat idle, to recite things that every man knoweth ; but yet, since the argument I handle leadeth me thereunto, I am glad that men shall perceive I am as willing to flatter, if they will so call it, an Alexander, or a Cæsar, or an Antoninus, that are dead many hundred years since, as any that now liveth : for it is the displaying of the glory of learning in sovereignty that I propound to myself, and not an humour of declaiming any man's praises. Observe then the speech he used of Diogenes, and see if it tend not to the true estate of one of the greatest questions of moral philosophy ; whether the enjoying of outward things, or the contemning of them, be the greatest happiness : for when he saw Diogenes

so perfectly contented with so little, he said to those that mocked at his condition ; " Were I not Alexander, I would wish to be Diogenes." But Seneca inverteth it, and saith ; " Plus erat, quod hic nollet accipere, quam quod ille posset dare." " There were more things which Diogenes would have refused, than those were, which Alexander could have given or enjoyed."

Observe again that speech which was usual with him, " That he felt his mortality chiefly in two things, sleep and lust ;" and see if it were not a speech extracted out of the depth of natural philosophy, and liker to have come out of the mouth of Aristotle or Democritus, than from Alexander.

See again that speech of humanity and poesy ; when upon the bleeding of his wounds, he called unto one of his flatterers, that was wont to ascribe to him divine honour, and said, " Look, this is very blood ; this is not such liquor as Homer speaketh of, which ran from Venus's hand, when it was pierced by Diomedes."

See likewise his readiness in reprehension of logic in the speech he used to Cassander, upon a complaint that was made against his father Antipater : for when Alexander happened to say, " Do you think these men would have come from so far to complain, except they had just cause of grief?" And Cassander answered, " Yea, that was the matter, because they thought they should not be disproved." Said Alexander laughing : " See the subtilities of Aristotle, to take a matter both ways, *pro et contra*," etc.

But note again how well he could use the same art, which he reprehended, to serve his own humour, when bearing a secret grudge to Callisthenes, because he was against the new ceremony of his adoration : feasting one night, where the same Callisthenes was at the table, it was moved by some, after supper, for entertainment sake, that Callisthenes, who was an eloquent man, might speak of some theme or purpose at his own choice : which Callisthenes did ; choosing the praise of the Macedonian nation for his discourse, and performing the same with so good manner, as the hearers were much ravished : whereupon Alexander, nothing pleased, said, " It was easy to be eloquent upon so good a subject. But," saith he, " turn your stile, and let us hear what you can say against us : " which Callisthenes presently undertook, and did with that sting and life, that Alexander interrupted him, and said, " The goodness of the cause made him eloquent before, and despite made him eloquent then again."

Consider farther, for tropes of rhetoric, that excellent use of a metaphor or translation, wherewith he taxed Antipater, who was an imperious and tyrannous governor : for when one of Antipater's friends commended him to Alexander for his moderation, that he did not degenerate, as his other lieutenants did, into the Persian pride in use of purple, but kept the ancient habit of Macedon, of black : " True," saith Alexander, " but Antipater is all purple within." Or that other when Parmenio came to him in the plain of Arbela, and showed him the innumerable multitude of his enemies, especially as they appeared by the infinite number of lights, as it had been a new firmament of

stars, and thereupon advised him to assail them by night : whereupon he answered that he would not steal the victory."

For matter of policy, weigh that significant distinction, so mach in all ages embraced, that he made between his two friends, Hephæstion and Craterus, when he said, " That the one loved Alexander, and the other loved the king : " describing the principal difference of princes' best servants, that some in affection love their person, and others in duty love their crown.

Weigh also that excellent taxation of an error ordinary with counsellors and princes, that they counsel their masters according to the model of their own mind and fortune, and not of their masters ; when, upon Darius's great offers, Parmenio had said, " Surely I would accept these offers, were I as Alexander ; " saith Alexander, " So would I, were I as Parmenio."

Lastly, weigh that quick and acute reply, which he made when he gave so large gifts to his friends and servants, and was asked what he did reserve for himself, and he answered, " Hope : " weigh, I say, whether he had not cast up his account right, because hope must be the portion of all that resolve upon great enterprises. For this was Cæsar's portion when he went first into Gaul, his estate being then utterly overthrown with largesses. And this was likewise the portion of that noble prince, howsoever transported with ambition, Henry duke of Guise, of whom it was usually said, that he was the greatest usurer in France, because he had turned all his estate into obligations.

To conclude therefore : as certain critics are used to say hyperbolically, " That if all sciences were lost, they might be found in Virgil ; " so certainly this may be said truly, there are the prints and footsteps of all learning in those few speeches which are reported of this prince : the admiration of whom, when I consider him not as Alexander the great, but as Aristotle's scholar, hath carried me too far.

As for Julius Cæsar, the excellency of his learning needeth not to be argued from his education, or his company, or his speeches ; but in a farther degree doth declare itself in his writings and works ; whereof some are extant and permanent, and some unfortunately perished. For, first we see, there is left unto us that excellent history of his own wars, which he intituled only a commentary, wherein all succeeding times have admired the solid weight of matter, and the real passages, and lively images of actions and persons, expressed in the greatest propriety of words and perspicuity of narration that ever was ; which that it was not the effect of a natural gift, but of learning and precept, is well witnessed by that work of his, intituled " De Analogia," being a grammatical philosophy, wherein he did labour to make this same *vox ad placitum* to become *vox ad licitum*, and to reduce custom of speech to congruity of speech ; and took, as it were, the picture of words from the life of reason.

So we receive from him, as a monument both of his power and learning, the then reformed computation of the year ; well expressing that he took it to be as great a glory to himself to observe and know the law of the heavens, as to give law to men upon the earth.

So likewise in that book of his, "Anti-Cato," it may easily appear that he did aspire as well to victory of wit as victory of war; undertaking therein a conflict against the greatest champion with the pen that then lived, Cicero the orator.

So again in his book of "Apophthegms," which he collected, we see that he esteemed it more honour to make himself but a pair of tables, to take the wise and pithy words of others, than to have every word of his own to be made an apophthegm, or an oracle; as vain princes, by custom of flattery, pretend to do. And yet if I should enumerate divers of his speeches, as I did those of Alexander, they are truly such as Solomon noted, when he saith, "*Verba sapientum tanquam aculei, et tanquam clavi in altum defixi*:" whereof I will only recite three, not so delectable for elegance, but admirable for vigour and efficacy.

As first, it is reason he be thought a master of words, that could with one word appease a mutiny in his army, which was thus: The Romans, when their generals did speak to their army, did use the word *Milites*, but when the magistrates spake to the people, they did use the word *Quirites*. The soldiers were in tumult, and seditiously prayed to be cashiered; not that they so meant, but by expostulation thereof to draw Cæsar to other conditions; wherein he being resolute not to give way, after some silence, he began his speech, "Ego, Quirites:" which did admit them already cashiered: wherewith they were so surprised, crossed, and confused, as they would not suffer him to go on in his speech, but relinquished their demands, and made it their suit, to be again called by the name of "Milites."

The second speech was thus: Cæsar did extremely affect the name of king; and some were set on, as he passed by, in popular acclamation to salute him king; whereupon, finding the cry weak and poor, he put it off thus, in a kind of jest, as if they had mistaken his surname; "Non rex sum, sed Cæsar;" a speech, that if it be searched, the life and fulness of it can scarce be expressed: for first, it was a refusal of the name, but yet not serious: again, it did signify an infinite confidence and magnanimity, as if he presumed Cæsar was the greater title, as by his worthiness it is come to pass till this day: but chiefly, it was a speech of great allurements towards his own purpose; as if the state did strive with him but for a name, whereof mean families were vested; for Rex was a surname with the Romans, as well as King is with us.

The last speech which I will mention, was used to Metellus; when Cæsar, after war declared, did possess himself of the city of Rome, at which time entering into the inner treasury to take the money there accumulated, Metellus, being tribune, forbad him: whereto Cæsar said, "That if he did not desist, he would lay him dead in the place." And presently taking himself up, he added, "Young man, it is harder for me to speak it, than to do it;" "*Adolescens, durius est mihi hoc dicere, quam facere*." A speech compounded of the greatest terror and greatest clemency that could proceed out of the mouth of man.

But to return, and conclude with him: it is evident, himself knew

well his own perfection in learning, and took it upon him : as appeared, when, upon occasion that some spake, what a strange resolution it was in Lucius Sylla to resign his dictatorship ; he scoffing at him, to his own advantage, answered, "That Sylla could not skill of letters, and therefore knew not how to dictate."

And here it were fit to leave this point, touching the concurrence of military virtue and learning, for what example should come with any grace, after those two of Alexander and Cæsar, were it not in regard of the rareness of circumstance, that I find in one other particular, as that which did so suddenly pass from extreme scorn to extreme wonder ; and it is of Xenophon the philosopher, who went from Socrates's school into Asia, in the expedition of Cyrus the younger, against king Artaxerxes. This Xenophon at that time was very young, and never had seen the wars before ; neither had any command in the army, but only followed the war as a voluntary, for the love and conversation of Proxenus his friend. He was present when Falinus came in message from the great king to the Grecians, after that Cyrus was slain in the field, and they a handful of men left to themselves in the midst of the king's territories, cut off from their country by many navigable rivers, and many hundred miles. The message imported that they should deliver up their arms, and submit themselves to the king's mercy. To which message before answer was made, divers of the army conferred familiarly with Falinus : and amongst the rest Xenophon happened to say, "Why, Falinus, we have now but these two things left, our arms and our virtue ; and if we yield up our arms, how shall we make use of our virtue?" Whereto Falinus, smiling on him said, "If I be not deceived, young gentleman, you are an Athenian, and, I believe you study philosophy, and it is pretty that you say ; but you are much abused, if you think your virtue can withstand the king's power." Here was the scorn : the wonder followed ; which was, that this young scholar, or philosopher, after all the captains were murdered in parley by treason, conducted those ten thousand foot, through the heart of all the king's high countries, from Babylon to Græcia in safety, in despite of all the king's forces, to the astonishment of the world, and the encouragement of the Grecians in time succeeding to make invasion upon the kings of Persia ; as was after purposed by Jason the Thessalian, attempted by Agesilaus the Spartan, and achieved by Alexander the Macedonian, all upon the ground of the act of that young scholar.

To proceed now from imperial and military virtue to moral and private virtue ; first, it is an assured truth, which is contained in the verses ;

Scilicet ingenuas didicisse fideliter artes,
Emollit mores, nec sinit esse feros.

It taketh away the wildness, and barbarism, and fierceness of men's minds : but indeed the accent had need be upon *fideliter* ; for a little superficial learning doth rather work a contrary effect. It taketh away all levity, temerity, and insolency, by copious suggestion of all doubts and difficulties, and acquainting the mind to balance reasons on

both sides, and to turn back the first offers and conceits of the mind, and to accept of nothing but examined and tried. It taketh away vain admiration of anything, which is the root of all weakness : for all things are admired, either because they are new, or because they are great. For novelty, no man that wadeth in learning or contemplation thoroughly, but will find that printed in his heart, "Nil novi super terram." Neither can any man marvel at the play of puppets, that goeth behind the curtain, and adviseth well of the motion. And for magnitude, as Alexander the great, after he was used to great armies, and the conquests of the spacious provinces in Asia, when he received letters out of Greece, of some fights and services there, which were commonly for a passage, or a fort, or some walled town at the most, he said, "It seemed to him, that he was advertised of the battle of the frogs and the mice, that the old tales went of." So certainly, if a man meditate upon the universal frame of nature, the earth with men upon it, the divineness of souls excepted, will not seem much other than an ant-hill, where some ants carry corn, and some carry their young, and some go empty, and all to and fro a little heap of dust. It taketh away or mitigateth fear of death, or adverse fortune ; which is one of the greatest impediments of virtue, and imperfections of manners. For if a man's mind be deeply seasoned with the consideration of the mortality and corruptible nature of things, he will easily concur with Epictetus, who went forth one day, and saw a woman weeping for her pitcher of earth that was broken ; and went forth the next day, and saw a woman weeping for her son that was dead ; and thereupon said, "Heri vidi fragilem frangi, hodie vidi mortalem mori." And therefore did Virgil excellently and profoundly couple the knowledge of causes, and the conquest of all fears together, as concomitantia :

Felix, qui potuit rerum cognoscere causas,
 Quique metus omnes, et inexorabile fatum
 Subjecit pedibus, strepitumque Acherontis avari.

It were too long to go over the particular remedies which learning doth minister to all the diseases of the mind, sometimes purging the ill humours, sometimes opening the obstructions, sometimes helping digestion, sometimes increasing appetite, sometimes healing the wounds and exulcerations thereof, and the like ; and therefore I will conclude with that which hath "*rationem totius*," which is, that it disposeth the constitution of the mind not to be fixed or settled in the defects thereof, but still to be capable and susceptible of growth and reformation. For the unlearned man knows not what it is to descend into himself, or to call himself to account ; nor the pleasure of that "*suavissima vita, indies sentire se fieri meliorem*." The good parts he hath, he will learn to show to the full, and use them dexterously, but not much to increase them ; the faults he hath, he will learn to hide and colour them, but not much to amend them : like an ill mower, that mows on still, and never whets his scythe. Whereas, with the learned man it fares otherwise that he doth ever intermix the correction and amendment of his mind, with the use and employ-

ment thereof. Nay, farther, in general and in sum, certain it is, that *veritas* and *bonitas* differ but as the seal and the print : for truth prints goodness ; and they be the clouds of error, which descend in the storms of passions and perturbations.

From moral virtue let us pass on to matter of power and commandment, and consider whether in right reason there be any comparable with that, wherewith knowledge investeth and crowneth man's nature. We see the dignity of the commandment is according to the dignity of the commanded : to have commandment over beasts, as herdmen have, is a thing contemptible ; to have commandment over children, as schoolmasters have, is a matter of small honour ; to have commandment over galley-slaves, is a disparagement, rather than an honour. Neither is the commandment of tyrants much better, over people which have put off the generosity of their minds : and therefore it was ever holden, that honours in free monarchies and commonwealths had a sweetness more than in tyrannies, because the commandment extendeth more over the wills of men, and not only over their deeds and services. And therefore when Virgil putteth himself forth to attribute to Augustus Cæsar the best of human honours, he doth it in these words :

——— victorque volentes
Per populos dat jura, viamque affectat Olympo.

But the commandment of knowledge is yet higher than the commandment over the will ; for it is a commandment over the reason, belief, and understanding of man, which is the highest part of the mind, and giveth law to the will itself : for there is no power on earth, which setteth up a throne, or chair of state, in the spirits and souls of men, and in their cogitations, imaginations, opinions, and beliefs, but knowledge and learning. And therefore we see the detestable and extreme pleasure that arch-heretics, and false prophets are transported with, when they once find in themselves that they have a superiority in the faith and conscience of men ; so great, as, if they have once tasted of it, it is seldom seen that any torture or persecution can make them relinquish or abandon it. But as this is that which the author of the "Revelation" calleth "the depth," or profoundness, "of Satan ;" so, by argument of contraries, the just and lawful sovereignty over men's understanding, by force of truth rightly interpreted, is that which approacheth nearest to the similitude of the divine rule.

As for fortune and advancement, the beneficence of learning is not so confined to give fortune only to states and commonwealths, as it doth not likewise give fortune to particular persons. For it was well noted long ago, that Homer hath given more men their livings, than either Sylla, or Cæsar, or Augustus ever did, notwithstanding their great largesses and donatives, and distributions of lands to so many legions ; and no doubt it is hard to say, whether arms or learning have advanced greater numbers. And in case of sovereignty we see, that if arms or descent have carried away the kingdom, yet

learning hath carried the priesthood, which ever hath been in some competition with empire.

Again, for the pleasure and delight of knowledge and learning, it far surpasseth all other in nature: for shall the pleasures of the affections so exceed the pleasures of the senses, as much as the obtaining of desire or victory exceedeth a song or a dinner? and must not, of consequence, the pleasures of the intellect, or understanding, exceed the pleasures of the affections? We see in all other pleasures there is a satiety, and after they be used, their verdure departeth; which showeth well they be but deceits of pleasure, and not pleasures; and that it was the novelty which pleased, and not the quality; and therefore we see that voluptuous men turn friars, and ambitious princes turn melancholy. But of knowledge there is no satiety, but satisfaction and appetite are perpetually interchangeable; and therefore appeareth to be good in itself simply, without fallacy or accident. Neither is that pleasure of small efficacy and contentment to the mind of man, which the poet Lucretius describeth elegantly:

Suave mari magno, turbantibus æquora ventis, etc.

“It is a view of delight,” saith he, “to stand or walk upon the shore side, and to see a ship tossed with tempest upon the sea; or to be in a fortified tower, and to see two battles join upon a plain; but it is a pleasure incomparable for the mind of man to be settled, landed, and fortified in the certainty of truth, and from thence to descry and behold the errors, perturbations, labours, and wanderings up and down of other men.”

Lastly, leaving the vulgar arguments that by learning man excelleth man in that wherein man excelleth beasts; that by learning man ascendeth to the heavens and their motions, where in body he cannot come, and the like: let us conclude with the dignity and excellency of knowledge and learning in that whereunto man's nature doth most aspire, which is, immortality or continuance: for to this tendeth generation, and raising of houses and families; to this tend buildings, foundations, and monuments; to this tendeth the desire of memory, fame, and celebration, and in effect the strength of all other human desires. We see then how far the monuments of wit and learning are more durable than the monuments of power, or of the hands. For have not the verses of Homer continued twenty-five hundred years, or more, without the loss of a syllable or letter; during which time, infinite palaces, temples, castles, cities, have been decayed and demolished? It is not possible to have the true pictures or statues of Cyrus, Alexander, Cæsar; no, nor of the kings or great personages of much later years; for the originals cannot last, and the copies cannot but lose of the life and truth. But the images of men's wits and knowledges remain in books exempted from the wrong of time, and capable of perpetual renovation. Neither are they fitly to be called images, because they generate still, and cast their seeds in the mind of others, provoking and causing infinite actions and opinions in succeeding ages: so that if the invention of the ship was thought

so noble, which carrieth riches and commodities from place to place, and consociateth the most remote regions in participation of their fruits ; how much more are letters to be magnified, which, as ships, pass through the vast seas of time, and make ages so distant to participate of the wisdom, illuminations, and inventions, the one of the other? Nay farther, we see, some of the philosophers which were least divine, and most immersed in the senses, and denied generally the immortality of the soul ; yet came to this point, that whatsoever motions the spirit of man could act and perform without the organs of the body, they thought might remain after death, which were only those of the understanding, and not of the affections ; so immortal and incorruptible a thing did knowledge seem unto them to be. But we, that know by divine revelation, that not only the understanding, but the affections purified ; not only the spirit, but the body changed, shall be advanced to immortality, do disclaim in these rudiments of the senses. But it must be remembered both in this last point, and so it may likewise be needful in other places, that in probation of the dignity of knowledge or learning, I did in the beginning separate divine testimony from human, which method I have pursued, and so handled them both apart.

Nevertheless I do not pretend, and I know it will be impossible for me, by any pleading of mine, to reverse the judgment, either of Æsop's cock, that preferred the barley-corn before the gem ; or of Midas, that being chosen judge between Apollo, president of the muses, and Pan, god of the flocks, judged for plenty ; or of Paris, that judged for beauty and love, against wisdom and power ; or of Agrippina, "*Occidat matrem, modo imperet,*" that preferred empire with any condition never so detestable ; or of Ulysses, "*qui vetulam prætulit immortalitati,*" being a figure of those which prefer custom and habit before all excellency ; or of a number of the like popular judgments. For these things must continue as they have been ; but so will that also continue, whereupon learning hath ever relied, and which faileth not : "*Justificata est Sapientia a filiis suis.*"

BOOK II.

It might seem to have more convenience, though it come often otherwise to pass, excellent king, that those, which are fruitful in their generations, and have in themselves the foresight of immortality in their descendants, should likewise be more careful of the good estate of future times, unto which, they know, they must transmit and commend their dearest pledges. Queen Elizabeth was a sojourner in the world, in respect of her unmarried life, and was a blessing to her own times ; and yet so as the impression of her good government, besides her happy memory, is not without some effect which doth survive her. But to your majesty, whom God hath already blessed with so much

royal issue, worthy to continue and represent you for ever ; and whose youthful and fruitful bed doth yet promise many the like renovations ; it is proper and agreeable to be conversant, not only in the transitory parts of good government, but in those acts also which are in their nature permanent and perpetual : amongst the which, if affection do not transport me, there is not any more worthy, than the farther endowment of the world with sound and fruitful knowledge. For why should a few received authors stand up like Hercules's columns ; beyond which there should be no sailing or discovering, since we have so bright and benign a star as your majesty, to conduct and prosper us ? To return therefore where we left, it remaineth to consider of what kind those acts are, which have been undertaken and performed by kings and others, for the increase and advancement of learning, wherein I purpose to speak actively, without digressing or dilating.

Let this ground therefore be laid, that all works are overcome by amplitude of reward, by soundness of direction, and by the conjunction of labours. The first multiplieth endeavour, the second preventeth error, and the third supplieth the frailty of man ; but the principal of these is direction : for "*claudus in via antevertit cursorem extra viam ;*" and Solomon excellently setteth it down, " If the iron be not sharp, it requireth more strength ; but wisdom is that which prevail-eth : " signifying, that the invention or election of the mean is more effectual than any inforcement or accumulation of endeavours. This I am induced to speak, for that, not derogating from the noble intention of any that have been deservers towards the state of learning, I do observe, nevertheless, that their works and acts are rather matters of magnificence and memory, than of progression and proficience, and tend rather to augment the mass of learning, in the multitude of learned men, than to rectify or raise the sciences themselves.

The works or acts of merit towards learning are conversant about three objects : the places of learning, the books of learning, and the persons of the learned. For as water, whether it be the dew of heaven, or the springs of the earth, doth scatter and lose itself in the ground, except it be collected into some receptacle, where it may by union comfort and sustain itself ; and for that cause the industry of man hath made and framed spring-heads, conduits, cisterns, and pools, which men have accustomed likewise to beautify and adorn with accomplishments of magnificence and state, as well as of use and necessity ; so this excellent liquor of knowledge, whether it descend from divine inspiration, or spring from human sense, would soon perish and vanish to oblivion, if it were not preserved in books, traditions, conferences, and places appointed ; as universities, colleges, and schools, for the receipt and comforting of the same.

The works which concern the seats and places of learning are four : foundations and buildings, endowments with revenues, endowments with franchises and privileges, institutions and ordinances for government ; all tending to quietness and privateness of life, and discharge of cares and troubles ; much like the stations which Virgil prescribeth for the hiving of bees :

Principio sedes apibus statioque petenda,
Quo neque sit ventis aditus, etc.

The works touching books are two ; first, libraries, which are as the shrines where all the relicks of the ancient saints, full of true virtue, and that without delusion or imposture, are preserved and reposed : secondly, new editions of authors, with more correct impressions, more faithful translations, more profitable glosses, more diligent annotations, and the like.

The works pertaining to the persons of learned men, besides the advancement and countenancing of them, in general, are two : the reward and designation of readers in sciences already extant and invented ; and the reward and designation of writers and inquirers concerning any parts of learning not sufficiently laboured and prosecuted.

These are summarily the works and acts, wherein the merits of many excellent princes and other worthy personages have been conversant. As for any particular commemorations, I call to mind what Cicero said, when he gave the general thanks : “ *Difficile non aliquem, ingratum quenquam præterire.*” Let us rather, according to the Scriptures, look unto the part of the race which is before us, than look back to that which is already attained.

First therefore, amongst so many great foundations of colleges in Europe, I find strange that they are all dedicated to professions, and none left free to arts and sciences at large. For if men judge that learning should be referred to action, they judge well ; but in this they fall into the error described in the ancient fable, in which the other parts of the body did suppose the stomach had been idle, because it neither performed the office of motion, as the limbs do, nor of sense, as the head doth ; but yet, notwithstanding, it is the stomach that digesteth and distributeth to all the rest : so if any man think philosophy and universality to be idle studies, he doth not consider that all professions are from thence served and supplied. And this I take to be a great cause that hath hindered the progression of learning, because these fundamental knowledges have been studied but in passage. For if you will have a tree bear more fruit than it hath used to do, it is not anything you can do to the boughs, but it is the stirring of the earth, and putting new mould about the roots, that must work it. Neither is it to be forgotten, that this dedicating of foundations and dotations to professory learning, hath not only had a malign aspect and influence upon the growth of sciences, but hath also been prejudicial to states and governments. For hence it proceedeth that princes find a solitude in regard of able men to serve them in causes of estate, because there is no education collegiate which is free, where such as were so disposed might give themselves to histories, modern languages, books of policy and civil discourse, and other the like enablements unto service of state.

And because founders of colleges do plant, and founders of lectures do water, it followeth well in order, to speak of the defect which is in public lectures ; namely, in the smallness and meanness of the salary

or reward, which in most places is assigned unto them ; whether they be lectures of arts or of professions. For it is necessary to the progression of sciences, that readers be of the most able and sufficient men, as those which are ordained for generating and propagating of sciences, and not for transitory use. This cannot be, except their condition and endowment be such as may content the ablest man to appropriate his whole labour, and continue his whole age in that function and attendance, and therefore must have a proportion answerable to that mediocrity or competency of advancement, which may be expected from a profession, or the practice of a profession. So as, if you will have sciences flourish, you must observe David's military law, which was, "That those which staid with the carriage, should have equal part with those which were in the action ;" else will the carriages be ill attended. So readers in sciences are indeed the guardians of the stores and provisions of sciences, whence men in active courses are furnished, and therefore ought to have equal entertainment with them ; otherwise if the fathers in sciences be of the weakest sort, or be ill-maintained,

Et patrum invalidi referent jejunia nati.

Another defect I note, wherein I shall need some alchemist to help me, who call upon men to sell their books, and to build furnaces, quitting and forsaking Minerva and the Muses as barren virgins, and relying upon Vulcan. But certain it is, that unto the deep, fruitful, and operative study of many sciences, especially natural philosophy and physick, books be not only the instrumentals wherein also the beneficence of men hath not been altogether wanting : for we see spheres, globes, astrolabes, maps, and the like, have been provided as appurtenances to astronomy and cosmography, as well as books ; we see likewise, that some places instituted for physick have annexed the commodity of gardens for simples of all sorts, and do likewise command the use of dead bodies for anatomies. But these do respect but a few things. In general, there will hardly be any main proficience in the disclosing of nature, except there be some allowance for expenses about experiments ; whether they be experiments appertaining to Vulcanus or Dædalus, furnace or engine, or any other kind ; and therefore as secretaries and spials of princes and states bring in bills for intelligence, so you must allow the spials and intelligencers of nature to bring in their bills, or else you shall be ill advertised.

And if Alexander made such a liberal assignation to Aristotle of treasure for the allowance of hunters, fowlers, fishers, and the like, that he might compile an history of nature, much better do they deserve it that travel in arts of nature.

Another defect which I note, is an intermission or neglect, in those which are governors in universities, of consultation ; and in princes, or superior persons, of visitation : to enter into account and consideration, whether the readings, exercises, and other customs, appertaining unto learning, anciently begun, and since continued, be well instituted or no, and thereupon to ground an amendment or reformation in that

which shall be found inconvenient. For it is one of your majesty's own most wise and princely maxims, "That in all usages and precedents, the times be considered wherein they first began, which if they were weak or ignorant, it derogateth from the authority of the usage, and leaveth it for suspect." And therefore inasmuch as most of the usages and orders of the universities were derived from more obscure times, it is the more requisite they be re-examined. In this kind I will give an instance or two, for example's sake, of things that are the most obvious and familiar: the one is a matter, which though it be ancient and general, yet I hold to be an error, which is, that scholars in universities come too soon and too unripe to logic and rhetoric, arts fitter for graduates than children and novices; for these two, rightly taken, are the gravest of sciences, being the arts of arts, the one for judgment, the other for ornament. And they be the rules and directions how to set forth and dispose matter; and therefore for minds empty and unfraught with matter, and which have not gathered that which Cicero calleth *sylva* and *supellex*, stuff and variety, to begin with those arts, as if one should learn to weigh, or to measure, or to paint the wind, doth work but this effect that the wisdom of those arts, which is great and universal, is almost made contemptible, and is degenerate into childish sophistry and ridiculous affectation. And farther, the untimely learning of them hath drawn on, by consequence, the superficial and unprofitable teaching and writing of them, as fitteth indeed to the capacity of children. Another, is a lack I find in the exercises used in the universities, which do make too great a divorce between invention and memory; for their speeches are either premeditate in *verbis conceptis*, where nothing is left to invention; or merely extemporal, where little is left to memory; whereas in life and action there is least use of either of these, but rather of intermixtures of premeditation and invention, notes and memory; so as the exercise fitteth not the practice, nor the image the life; and it is ever a true rule in exercises, that they be framed as near as may be to the life of practice, for otherwise they do pervert the motions and faculties of the mind, and not prepare them. The truth whereof is not obscure, when scholars come to the practices of professions, or other actions of civil life, which when they set into, this want is soon found by themselves, and sooner by others. But this part, touching the amendment of the institutions and orders of universities, I will conclude with the clause of Cæsar's letter to Oppius and Balbus, "*Hoc quemadmodum fieri possit, nonnulla mihi in mentem veniunt, et multa reperiri possunt: de iis rebus rogo vos, ut cogitationem suscipiatis.*"

Another defect, which I note, ascendeth a little higher than the precedent; for as the proficience of learning consisteth much in the orders and institutions of universities in the same states and kingdoms, so it would yet more be advanced, if there were more intelligence mutual between the universities of Europe than now there is. We see there be many orders and foundations, which though they be divided under several sovereignties and territories, yet they take themselves to have a kind of contract, fraternity, and

correspondence one with another, insomuch as they have provincials and generals. And surely as nature createth brotherhood in families, and arts mechanical contract brotherhoods in commonalties, and the anointment of God superinduceth a brotherhood in kings and bishops : so in like manner there cannot but be a fraternity in learning and illumination, relating to that paternity which is attributed to God, who is called the Father of illuminations or lights.

The last defect which I will note is, that there hath not been, or very rarely been, any public designation of writers or inquirers concerning such parts of knowledge, as may appear not to have been already sufficiently laboured or undertaken : unto which point it is an inducement to enter into a view and examination what parts of learning have been prosecuted, and what omitted : for the opinion of plenty is amongst the causes of want, and the great quantity of books maketh a show rather of superfluity than lack ; which surcharge, nevertheless, is not to be remedied by making no more books, but by making more good books, which, as the serpent of Moses, might devour the serpents of the enchanters.

The removing of all the defects formerly enumerated, except the last, and of the active part also of the last, which is the designation of writers, are *opera basilica* ; towards which the endeavours of a private man may be but as an image in a cross-way, that may point at the way, but cannot go it. But the inducing part of the latter, which is the survey of learning, may be set forward by private travel : wherefore I will now attempt to make a general and faithful perambulation of learning, with an inquiry what parts thereof lie fresh and waste, and not improved and converted by the industry of man ; to the end that such a plot, made and recorded to memory, may both minister light to any public designation, and also serve to excite voluntary endeavours : wherein, nevertheless, my purpose is at this time to note only omissions and deficiencies, and not to make any redargution of errors, or incomplete prosecutions : for it is one thing to set forth what ground lieth unmanured, and another thing to correct ill husbandry in that which is manured.

In the handling and undertaking of which work I am not ignorant what it is that I do now move and attempt, nor insensible of mine own weakness to sustain my purpose ; but my hope is that if my extreme love to learning carry me too far, I may obtain the excuse of affection ; for that " it is not granted to man to love and to be wise." But, I know well, I can use no other liberty of judgment than I must leave to others ; and I, for my part, shall be indifferently glad either to perform myself, or to accept from another, that duty of humanity, "*Nam qui erranti comiter monstrat viam,*" etc. I do foresee likewise, that of those things which I shall enter and register, as deficiencies and omissions, many will conceive and censure, that some of them are already done and extant ; others to be but curiosities, and things of no great use ; and others to be of too great difficulty, and almost impossibility to be compassed and effected : but for the two first, I refer myself to the particulars ; for the last, touching impossibility, I take it,

those things are to be held possible, which may be done by some person, though not by every one ; and which may be done by many, though not by any one ; and which may be done in succession of ages, though not within the hour-glass of one man's life ; and which may be done by public designation, though not by private endeavour.

But, notwithstanding, if any man will take to himself rather that of Solomon, "*Dicit piger, Leo est in via,*" than that of Virgil, "*Possunt quia posse videntur :*" I shall be content that my labours be esteemed but as the better sort of wishes ; for as it asketh some knowledge to demand a question not impertinent, so it requireth some sense to make a wish not absurd.

THE parts of human learning have reference to the three parts of man's Understanding, which is the seat of learning : History to his Memory, Poesy to his Imagination, and Philosophy to his Reason. Divine learning receiveth the same distribution, for the spirit of man is the same, though the revelation of oracle and sense be diverse : so as theology consisteth also of history of the Church ; of parables, which is divine poesy ; and of holy doctrine or precept : for as for that part which seemeth supernumerary, which is prophecy, it is but divine history ; which hath that prerogative over human, as the narration may be before the fact, as well as after.

HISTORY is *Natural, Civil, Ecclesiastical, and Literary* ; whereof the three first I allow as extant, the fourth I denote as deficient. For no man hath propounded to himself the general state of learning to be described and represented from age to age, as many have done the works of nature, and the state civil and ecclesiastical ; without which the history of the world seemeth to me to be as the statue of Polyphemus with his eye out, that part being wanting which doth most show the spirit and life of the person : and yet I am not ignorant, that in divers particular sciences, as of the juriconsults, the mathematicians, the rhetoricians, the philosophers, there are set down some small memorials of the schools, authors, and books ; and so likewise some barren relations touching the invention of arts or usages.

But a just story of learning, containing the antiquities and originals of knowledges and their sects, their inventions, their traditions, their divers administrations and managings, their flourishings, their oppositions, decays, depressions, oblivions, removes, with the causes and occasions of them, and all other events concerning learning, throughout the ages of the world, I may truly affirm to be wanting.

The use and end of which work, I do not so much design for curiosity, or satisfaction of those that are lovers of learning, but chiefly for a more serious and grave purpose, which is this in a few words, that it will make learned men wise in the use and administration of learning. For it is not St. Augustine's nor St. Ambrose's works that will make so wise a divine, as ecclesiastical history thoroughly read and observed : and the same reason is of learning.

HISTORY of *Nature* is of three sorts ; of nature in course, of nature

erring or varying, and of nature altered or wrought ; that is, history of creatures, history of marvels, and history of arts.

The first of these, no doubt, is extant, and that in good perfection ; the two latter are handled so weakly and unprofitably, as I am moved to note them as deficient.

For I find no sufficient or competent collection of the works of nature, which have a digression and deflexion from the ordinary course of generations, productions, and motions, whether they be singularities of place and region, or the strange events of time and chance, or the effects of yet unknown properties, or the instances of exception to general kinds : it is true, I find a number of books of fabulous experiments and secrets, and frivolous impostures for pleasure and strangeness : but a substantial and severe collection of the heteroclitics, or irregulars of nature, well examined and described, I find not, especially not with due rejection of fables, and popular errors : for as things now are, if an untruth in nature be once on foot, what by reason of the neglect of examination and countenance of antiquity, and what by reason of the use of the opinion in similitudes and ornaments of speech, it is never called down.

The use of this work, honoured with a precedent in Aristotle, is nothing less than to give contentment to the appetite of curious and vain wits, as the manner of mirabilaries is to do ; but for two reasons, both of great weight : the one, to correct the partiality of axioms and opinions, which are commonly framed only upon common and familiar examples ; the other, because from the wonders of nature is the nearest intelligence and passage towards the wonders of art : for it is no more, but by following, and as it were hounding nature in her wanderings, to be able to lead her afterwards to the same place again.

Neither am I of opinion, in this history of marvels, that superstitious narrations of sorceries, witchcrafts, dreams, divinations, and the like, where there is an assurance and clear evidence of the fact, be altogether excluded. For it is not yet known in what cases, and how far, effects attributed to superstition do participate of natural causes : and therefore howsoever the practice of such things is to be condemned, yet from the speculation and consideration of them light may be taken, not only for the discerning of the offences, but for the farther disclosing of nature. Neither ought a man to make scruple of entering into these things for inquisition of truth, as your majesty hath showed in your own example : who with the two clear eyes of religion and natural philosophy have looked deeply and wisely into these shadows, and yet proved yourself to be of the nature of the sun, which passeth through pollutions, and itself remains as pure as before.

But this I hold fit, that these narrations, which have mixture with superstition, be sorted by themselves, and not to be mingled with the narrations, which are merely and sincerely natural.

But as for the narrations touching the prodigies and miracles of religions, they are either not true, or not natural ; and therefore impertinent for the story of nature.

For history of nature wrought, or mechanical, I find some collections

made of agriculture, and likewise of manual arts, but commonly with a rejection of experiments familiar and vulgar.

For it is esteemed a kind of dishonour unto learning, to descend to inquiry or meditation upon matters mechanical, except they be such as may be thought secrets, rarities, and special subtilties ; which humour of vain and supercilious arrogance is justly derided in Plato ; where he brings in Hippias, a vaunting sophist, disputing with Socrates, a true and unfeigned inquisitor of truth ; where the subject being touching beauty, Socrates, after his wandering manner of inductions, put first an example of a fair virgin, and then of a fair horse, and then of a fair pot well glazed, whereat Hippias was offended ; and said, " More than for courtesy's sake, he did not think much to dispute with any that did alledge such base and sordid instances : whereunto Socrates answered, You have reason, and it becomes you well, being a man so trim in your vestments," etc. And so goeth on in an irony.

But the truth is, they be not the highest instances that give the securest information ; as may be well expressed in the tale so common of the philosopher, that while he gazed upwards to the stars fell into the water ; for if he had looked down he might have seen the stars in the water, but looking aloft, he could not see the water in the stars. So it cometh often to pass, that mean and small things discover great, better than great can discover the small ; and therefore Aristotle noteth well, " that the nature of every thing is best seen in his smallest portions." And for that cause he inquireth the nature of a common-wealth, first in a family, and the simple conjugations of man and wife, parent and child, master and servant, which are in every cottage. Even so likewise the nature of this great city of the world, and the policy thereof, must be first sought in mean concordances and small portions. So we see how that secret of nature, of the turning of iron, touched with the loadstone, towards the north was found out in needles of iron, not in bars of iron.

But if my judgment be of any weight, the use of History Mechanical is, of all others, the most radical and fundamental towards natural philosophy ; such natural philosophy as shall not vanish in the fume of subtle, sublime, or delectable speculation, but such as shall be operative to the endowment and benefit of man's life : for it will not only minister and suggest for the present many ingenious practices in all trades, by a connexion and transferring of the observations of one art to the use of another, when the experiences of several mysteries shall fall under the consideration of one man's mind ; but farther, it will give a more true and real illumination concerning causes and axioms than is hitherto attained.

For like as a man's disposition is never well known till he be crossed, nor Proteus ever changed shapes till he was straitened and held fast ; so the passages and variations of nature cannot appear so fully in the liberty of nature, as in the trials and vexations of art.

For *Civil History*, it is of three kinds, not unfitly to be compared with the three kinds of pictures or images : for of pictures or images,

we see, some are unfinished, some are perfect, and some are defaced. So of histories we may find three kinds, Memorials, Perfect Histories, and Antiquities; for memorials are history unfinished, or the first or rough draughts of history; and antiquities are history defaced, or some remnants of history which have casually escaped the shipwreck of time.

Memorials, or preparatory history, are of two sorts, whereof the one may be termed Commentaries, and the other Registers. Commentaries are they which set down a continuance of the naked events and actions, without the motives or designs, the counsels, the speeches, the pretexts, the occasions, and other passages of action: for this is the true nature of a Commentary, though Cæsar, in modesty mixed with greatness, did for his pleasure apply the name of a Commentary to the best history of the world. Registers are collections of public acts, as decrees of council, judicial proceedings, declarations and letters of state, orations, and the like, without a perfect continuance or contexture of the thread of the narration.

Antiquities, or remnants of history, are, as was said, *tanquam tabula naufragii*, when industrious persons, by an exact and scrupulous diligence and observation, out of monuments, names, words, proverbs, traditions, private records and evidences, fragments of stories, passages of books that concern not story, and the like, do save and recover somewhat from the deluge of time.

In these kinds of imperfect histories I do assign no deficiency, for they are *tanquam imperfecte mista*, and therefore any deficiency in them is but their nature.

As for the corruptions and moths of history, which are Epitomes, the use of them deserveth to be banished, as all men of sound judgment have confessed, as those that have fretted and corroded the sound bodies of many excellent histories, and wrought them into base and unprofitable dregs.

History, which may be called *Just* and *Perfect History*, is of three kinds, according to the object which it propoundeth, or pretendeth to represent: for it either representeth a time, or a person, or an action. The first we call Chronicles, the second Lives, and the third Narrations, or Relations.

Of these, although the first be the most complete and absolute kind of history, and hath most estimation and glory, yet the second excelleth it in profit and use, and the third in verity and sincerity. For history of times representeth the magnitude of actions, and the public faces and deportments of persons, and passeth over in silence the smaller passages and motions of men and matters.

But such being the workmanship of God, as he doth hang the greatest weight upon the smallest wires, *maxima e minimis suspendens*, it comes therefore to pass, that such histories do rather set forth the pomp of business than the true and inward resorts thereof. But lives, if they be well written, propounding to themselves a person to represent, in whom actions, both greater and smaller, public and private, have a commixture, must of a necessity contain a more true, native, and lively representation. So again narrations and relations of actions,

as the War of Peloponnesus, the Expedition of Cyrus Minor, the Conspiracy of Catiline, cannot but be more purely and exactly true, than histories of times, because they may choose an argument comprehensible within the notice and instructions of the writer : whereas he that undertaketh the story of a time, especially of any length, cannot but meet with many blanks and spaces, which he must be forced to fill up out of his own wit and conjecture.

For the *History of Times*, I mean of civil history, the providence of God hath made the distribution : for it hath pleased God to ordain and illustrate two exemplar states of the world for arms, learning, moral virtue, policy, and laws. The state of Græcia, and the state of Rome : the histories whereof occupying the middle part of time, have more ancient to them, histories which may by one common name be termed the Antiquities of the world ; and after them, histories which may be likewise called by the name of Modern History.

Now to speak of the deficiencies. As to the heathen antiquities of the world, it is in vain to note them for deficient : deficient they are no doubt, consisting most of fables and fragments, but the deficiency cannot be holpen ; for antiquity is like fame, *caput inter nubila condit*, her head is muffled from our sight. For the history of the exemplar states, it is extant in good perfection. Not but I could wish there were a perfect course of history for Græcia from Theseus to Philopœmen, what time the affairs of Græcia were drowned and extinguished in the affairs of Rome ; and for Rome from Romulus to Justinianus, who may be truly said to be *ultimus Romanorum*. In which sequences of story the text of Thucydides and Xenophon in the one, and the text of Livius, Polybius, Salustius, Cæsar, Appianus, Tacitus, Herodianus, in the other, to be kept entire, without any diminution at all, and only to be supplied and continued. But this is matter of magnificence, rather to be commended than required ; and we speak now of parts of learning supplemental, and not of supererogation.

But for Modern Histories, whereof there are some few very worthy, but the greater part beneath mediocrity, leaving the care of foreign stories to foreign states, because I will not be *curiosus in aliena republica*, I cannot fail to represent to your majesty the unworthiness of the history of England in the main continuance thereof, and the partiality and obliquity of that of Scotland, in the latest and largest author that I have seen ; supposing that it would be honour for your majesty, and a work very memorable, if this island of Great Britain, as it is now joined in monarchy for ages to come, so were joined in one history for the times passed, after the manner of the sacred history, which draweth down the story of the ten tribes, and of the two tribes, as twins, together. And if it shall seem that the greatness of this work may make it less exactly performed, there is an excellent period of a much smaller compass of time, as to the story of England ; that is to say, from the uniting of the roses to the uniting of the kingdoms : a portion of time, wherein to my understanding, there hath been the rarest varieties, that in like number of successions of any hereditary monarchy hath been known : for it beginneth with the mixed adention

of a crown by arms and title; an entry by battle, an establishment by marriage; and therefore times answerable, like waters after a tempest, full of working and swelling, though without extremity of storm: but well passed through by the wisdom of the pilot, being one of the most sufficient kings of all the number. Then followeth the reign of a king, whose actions, howsoever conducted, had much intermixture with the affairs of Europe, balancing and inclining them variably; in whose time also began that great alteration in the state ecclesiastical, an action which seldom cometh upon the stage. Then the reign of a minor: then an offer of an usurpation, though it was but as *febris ephemera*: then the reign of a queen matched with a foreigner: then of a queen that lived solitary and unmarried, and yet her government so masculine, as it had greater impression and operation upon the states abroad than it any ways received from thence. And now last, this most happy and glorious event, that this island of Britain, divided from all the world, should be united in itself: and that oracle of rest, given to Æneas, "*Antiquam exquirite matrem*," should now be performed and fulfilled upon the nations of England and Scotland, being now reunited in the ancient mother name of Britain, as a full period of all instability and peregrinations: so that as it cometh to pass in massive bodies, that they have certain trepidations and waverings before they fix and settle; so it seemeth that by the providence of God this monarchy, before it was to settle in your majesty and your generations, in which I hope it is now established for ever, it had these preclusive changes and varieties.

For *Lives*; I do find strange that these times have so little esteemed the virtues of the times, as that the writing of lives should be no more frequent. For although there be not many sovereign princes or absolute commanders, and that states are most collected into monarchies, yet there are many worthy personages that deserve better than dispersed report or barren eulogies. For herein the invention of one of the late poets is proper, and doth well enrich the ancient fiction: for he feigneth, that at the end of the thread or web of every man's life there was a little medal containing the person's name, and that Time waited upon the shears; and as soon as the thread was cut, caught the medals, and carried them to the river of Lethe; and about the bank there were many birds flying up and down, that would get the medals, and carry them in their beak a little while, and let them fall into the river: only there were a few swans, which if they got a name, would carry it to a temple, where it was consecrated.

And though many men, more mortal in their affections than in their bodies, do esteem desire of name and memory but as a vanity and ventosity,

Animi nil magnæ laudis egentes;

which opinion cometh from the root, "*non prius laudes contempsimus, quam laudanda facere desivimus*:" yet that will not alter Solomon's judgment, "*Memoria iusti cum laudibus, at impiorum nomen pu-*

trescet:" the one flourisheth, the other either consumeth to present oblivion, or turneth to an ill odour.

And therefore in that stile or addition, which is and hath been long well received and brought in use, "*felicitis memoriæ, piæ memoriæ, bonæ memoriæ*," we do acknowledge that which Cicero saith, borrowing it from Demosthenes, that "*bona fama propria possessio defunctorum*;" which possession I cannot but note, that in our time it lieth much waste, and that therein there is a deficiency.

For *Narrations* and *Relations* of particular actions, there were also to be wished a greater diligence therein; common way, before we come where the ways part, for there is no great action but hath some good pen which attends it.

And because it is an ability not common to write a good history, as may well appear by the small number of them; yet if particularity of actions memorable were but tolerably reported as they pass, the compiling of a complete history of times might be the better expected, when a writer should arise that were fit for it; for the collection of such relations might be as a nursery garden, whereby to plant a fair and stately garden, when time should serve.

There is yet another partition of history which Cornelius Tacitus maketh, which is not to be forgotten, especially with that application which he accouplieth it withal, *Annals* and *Journals*: appropriating to the former, matters of state; and to the latter, acts and accidents of a meaner nature. For giving but a touch to certain magnificent buildings, he addeth, "*Cum ex dignitate populi Romani repertum sit, res illustres annalibus, talia diurnis urbis actis mandare.*" So as there is a contemplative kind of heraldry, as well as civil. And as nothing doth derogate from the dignity of a state more than confusion of degrees; so it doth not a little embase the authority of an history, to intermingle matters of triumph, or matters of ceremony, or matters of novelty, with matters of state. But the use of a journal hath not only been in the history of time, but likewise in the history of persons, and chiefly of actions; for princes in ancient time had, upon point of honour and policy both, journals kept, what passed day by day: for we see the chronicle which was read before Ahasuerus, when he could not take rest, contained matters of affairs indeed, but such as had passed in his own time, and very lately before: but the journal of Alexander's house expressed every small particularity even concerning his person and court; and it is yet an use well received in enterprises memorable, as expeditions of war, navigations, and the like, to keep diaries of that which passeth continually.

I cannot likewise be ignorant of a form of writing, which some grave and wise men have used, containing a scattered history of those actions which they have thought worthy of memory, with politic discourse and observation thereupon; not incorporated into the history, but separately, and as the more principal in their intention; which kind of ruminated history I think more fit to place amongst books of policy, whereof we shall hereafter speak, than amongst books of history: for it is the true office of history to represent the events

themselves together with the counsels, and to leave the observations and conclusions thereupon to the liberty and faculty of every man's judgment; but mixtures are things irregular, whereof no man can define.

So also is there another kind of history manifoldly mixed, and that is History of Cosmography, being compounded of natural history, in respect of the regions themselves; of history civil, in respect of the habitations, regiments, and manners of the people; and the mathematics, in respect of the climates and configurations towards the heavens: which part of learning of all others, in this later time, hath obtained most proficiencie. For it may be truly affirmed to the honour of these times, and in a virtuous emulation with antiquity, that this great building of the world had never thorough lights made in it, till the age of us and our fathers: for although they had knowledge of the antipodes,

Nosque ubi primus equis oriens afflavit anhelis,
Illic sera rubens accendit lumina Vesper:

yet that might be by demonstration, and not in fact; and if by travel, it requireth the voyage but of half the globe. But to circle the earth, as the heavenly bodies do, was not done or enterprised till these later times: and therefore these times may justly bear in their word, not only *plus ultra* in precedence of the ancient *non ultra*, and *imitabile fulmen*, in precedence of the ancient *non imitabile fulmen*.

Demens qui nimbos et non imitabile fulmen, etc.

but likewise *imitabile calum*: in respect of the many memorable voyages, after the manner of heaven, about the globe of the earth.

And this proficiencie in navigation and discoveries may plant also an expectation of the farther proficiencie and augmentation of all sciences; because, it may seem, they are ordained by God to be coevals, that is, to meet in one age. For so the prophet Daniel, speaking of the latter times, foretellet; "Plurimi pertransibunt, et multiplex erit scientia;" as if the openness and thorough passage of the world, and the increase of knowledge, were appointed to be in the same ages, as we see it is already performed in great part; the learning of these latter times not much giving place to the former two periods or returns of learning, the one of the Grecians, the other of the Romans.

HISTORY ecclesiastical receiveth the same divisions with history civil; but farther, in the propriety thereof, may be divided into the History of the Church, by a general name; History of Prophecy; and History of Providence.

The first describeth the times of the militant Church, whether it be fluctuant, as the ark of Noah; or moveable, as the ark in the wilderness; or at rest, as the ark in the temple; that is, the state of the Church in persecution, in remove, and in peace. This part I ought in no sort to note as deficient, only I would the virtue and sincerity of it were according to the mass and quantity. But I am not now in hand with censures, but with omissions.

The second, which is history of prophecy, consisteth of two relatives, the prophecy, and the accomplishment ; and therefore the nature of such a work ought to be, that every prophecy of the Scripture be sorted with the event fulfilling the same, throughout the ages of the world ; both for the better confirmation of faith, and for the better illumination of the Church touching those parts of prophecies which are yet unfulfilled : allowing nevertheless that latitude which is agreeable and familiar unto divine prophecies, being of the nature of their Author, with whom a thousand years are but as one day, and therefore are not fulfilled punctually at once, but have springing and germinant accomplishment throughout many ages ; though the height or fulness of them may refer to some one age.

This is a work which I find deficient, but is to be done with wisdom, sobriety, and reverence, or not at all.

The third, which is history of providence, containeth that excellent correspondence which is between God's revealed will and his secret will : which though it be so obscure, as for the most part it is not legible to the natural man ; no, nor many times to those that behold it from the tabernacle ; yet at some times it pleaseth God, for our better establishment, and the confuting of those which are as without God in the world, to write it in such text and capital letters, that, as the prophet saith, " he that runneth by may read it ; " that is, mere sensual persons, which hasten by God's judgments, and never bend or fix their cogitations upon them, are nevertheless in their passage and race urged to discern it. Such are the notable events and examples of God's judgments, chastisements, deliverances and blessings : and this is a work which hath passed through the labours of many, and therefore I cannot present as omitted.

There are also other parts of learning which are Appendices to history ; for all the exterior proceedings of man consist of words and deeds ; whereof history doth properly receive and retain in memory the deeds ; and if words, yet but as inducements and passages to deeds : so are there other books and writings, which are appropriate to the custody and receipt of words only, which likewise are of three sorts : Orations, Letters, and Brief Speeches or Sayings.

Orations are pleadings, speeches of counsel, laudatives, invectives, apologies, reprehensions ; orations of formality or ceremony, and the like.

Letters are according to all the variety of occasions, advertisements, advices, directions, propositions, petitions, commendatory, expostulatory, satisfactory ; of compliment, of pleasure, of discourse, and all other passages of action. And such as are written from wise men, are of all the words of man, in my judgment, the best ; for they are more natural than orations and public speeches, and more advised than conferences or present speeches. So again letters of affairs from such as manage them or are privy to them, are of all others the best instructions for history, and to a diligent reader the best histories in themselves.

For Apophthegms, it is a great loss of that book of Cæsar's ; for as

his history, and those few letters of his which we have, and those apophthegms which were of his own, excel all men's else, so I suppose would his collection of apophthegms, have done ; for as for those which are collected by others, either I have no taste in such matters, or else their choice hath not been happy. But upon these three kinds of writings I do not insist, because I have no deficiencies to propound concerning them.

Thus much therefore concerning History, which is that part of learning which answereth to one of the cells, domiciles, or offices of the mind of man, which is that of the Memory.

POESY is a part of learning in measure of words for the most part restrained, but in all other points extremely licensed, and doth truly refer to the imagination ; which being not tied to the laws of matter, may at pleasure join that which nature hath severed, and sever that which nature hath joined, and so make unlawful matches and divorces of things, *Pictoribus atque poetis, etc.* It is taken in two senses, in respect of words, or matter ; in the first sense, it is but a character of stile, and belongeth to arts of speech, and is not pertinent for the present : in the latter, it is, as hath been said, one of the principal portions of learning, and is nothing else but feigned history, which may be stiled as well in prose as in verse.

The use of this feigned history hath been to give some shadow of satisfaction to the mind of man in those points wherein the nature of things doth deny it, the world being in proportion inferior to the soul ; by reason whereof there is, agreeable to the spirit of man, a more ample greatness, a more exact goodness, and a more absolute variety, than can be found in the nature of things. Therefore, because the acts or events of true history have not that magnitude which satisfieth the mind of man, poesy feigneth acts and events greater and more heroical : because true history propoundeth the successes and issues of actions not so agreeable to the merits of virtue and vice, therefore poesy feigns them more just in retribution, and more according to revealed providence : because true history representeth actions and events more ordinary, and less interchanged ; therefore poesy endueth them with more rareness, and more unexpected and alternative variations : so as it appeareth that poesy serveth and conferreth to magnanimity, morality, and to delectation. And therefore it was ever thought to have some participation of divineness, because it doth raise and erect the mind, by submitting the shows of things to the desires of the mind ; whereas reason doth buckle and bow the mind unto the nature of things.

And we see, that by these insinuations and congruities with man's nature and pleasure, joined also with the agreement and consort it hath with music, it hath had access and estimation in rude times and barbarous regions, where other learning stood excluded.

The division of poesy, which is aptest in the propriety thereof, besides those divisions which are common unto it with history ; as feigned chronicles, feigned lives, and the appendices of history, as feigned

epistles, feigned orations, and the rest, is into Poesy Narrative, Representative, and Allusive.

The Narrative is a mere imitation of history, with the excesses before remembered, choosing for subject commonly wars and love; rarely state, and sometimes pleasure and mirth.

Representative is as a visible history, and is an image of actions as if they were present, as history is of actions in nature as they are, that is, past.

Allusive or parabolical, is a narration applied only to express some special purpose or conceit; which latter kind of parabolical wisdom was much more in use in the ancient times, as by the fables of Æsop, and the brief sentences of the Seven, and the use of hieroglyphics, may appear. And the cause was, for that it was then of necessity to express any point of reason, which was more sharp or subtile than the vulgar, in that manner, because men in those times wanted both variety of examples and subtilty of conceit: and as hieroglyphics were before letters, so parables were before arguments. And nevertheless now, and at all times, they do retain much life and vigour, because reason cannot be so sensible nor examples so fit.

But there remaineth yet another use of poesy parabolical, opposite to that which we last mentioned: for that tendeth to demonstrate and illustrate that which is taught or delivered, and this other to retire and obscure it: that is, when the secrets and mysteries of religion, policy, and philosophy are involved in fables and parables.

Of this in divine poesy, we see the use is authorized. In heathen poesy, we see, the exposition of fables doth fall out sometimes with great felicity, as in the fable that the giants being overthrown in their war against the gods, the Earth their mother, in revenge thereof, brought forth Fame:

Illam Terra parens ira irritata deorum,
Extremam, ut perhibent, Cæro Enceladoque sororem
Progeniuit.

Expounded, that when princes and monarchies have suppressed actual and open rebels, then the malignity of people, which is the mother of rebellion, doth bring forth libels and slanders, and taxations of the states, which is of the same kind with rebellion, but more feminine. So in the fable, that the rest of the gods having conspired to bind Jupiter, Pallas called Briareus with his hundred hands to his aid: expounded, that monarchies need not fear any curbing of their absoluteness by mighty subjects, as long as by wisdom they keep the hearts of the people, who will be sure to come in on their side. So in the fable, that Achilles was brought up under Chiron the Centaur, who was part a man and part a beast: expounded ingeniously, but corruptly by Machiavel, that it belongeth to the education and discipline of princes, to know as well how to play the part of the lion in violence, and the fox in guile, as of the man in virtue and justice.

Nevertheless in many the like encounters, I do rather think that the fable was first, and the exposition devised, than that the moral was first, and thereupon the fable framed. For I find it was an ancient vanity in Chrysippus, that troubled himself with great contention to

fasten the assertion of the Stoics upon the fictions of the ancient poets ; but yet that all the fables and fictions of the poets were but pleasure and not figure, I interpose no opinion.

Surely of those poets which are now extant, even Homer himself, notwithstanding he was made a kind of Scripture by the latter schools of the Grecians, yet I should without any difficulty pronounce, that his fables had no such inwardness in his own meaning ; but what they might have, upon a more original tradition, is not easy to affirm, for he was not the inventor of many of them.

In this third part of learning, which is poesy, I can report no deficiency. For being as a plant that cometh of the lust of the earth, without a formal seed, it hath sprung up and spread abroad more than any other kind : but to ascribe unto it that which is due, for the expression of affections, passions, corruptions, and customs, we are beholden to poets more than to the philosopher's works ; and for wit and eloquence, not much less than to orators and harangues. But it is not good to stay too long in the theatre. Let us now pass on to the judicial place or palace of the mind, which we are to approach and view with more reverence and attention.

THE knowledge of man is as the waters, some descending from above, and some springing from beneath ; the one informed by the light of nature, the other inspired by divine revelation.

The light of nature consisteth in the notions of the mind, and the reports of the senses ; for as for knowledge which man receiveth by teaching, it is cumulative, and not original, as in a water, that, besides his own spring-head, is fed with other springs and streams. So then, according to these two differing illuminations or originals, knowledge is first of all divided into Divinity and Philosophy.

In philosophy, the contemplations of man do either penetrate unto God, or are circumferred unto nature, or are reflected or reverted upon himself. Out of which several inquiries there do arise three knowledges, Divine philosophy, Natural philosophy, and Human philosophy or humanity. For all things are marked and stamped with this triple character, of the power of God, the difference of nature, and the use of man. But because the distributions and partitions of knowledge are not like several lines that meet in one angle, and so touch but in a point ; but are like branches of a tree, that meet in a stem, which hath a dimension and quantity of entireness and continuance, before it come to discontinue and break itself into arms and boughs ; therefore it is good, before we enter into the former distribution, to erect and constitute one universal science, by the name of *Philosophia prima*, primitive or summary philosophy, as the main and common way, before we come where the ways part and divide themselves ; which science, whether I should report as deficient or no, I stand doubtful.

For I find a certain rhapsody of natural theology, and of divers parts of logic ; and of that other part of natural philosophy, which concerneth the principles ; and of that other part of natural philosophy, which concerneth the soul or spirit ; all these strangely commixed and

confused : but being examined, is seemeth to me rather a depredation of other sciences, advanced and exalted unto some height of terms, than anything solid or substantive of itself.

Nevertheless I cannot be ignorant of the distinction which is current, that the same things are handled but in several respects. As for example, that logic considereth of many things as they are in notion ; and this philosophy, as they are in nature ; the one in appearance, the other in existence : but I find this difference better made than pursued. For if they had considered quantity, similitude, diversity, and the rest of those external characters of things, as philosophers, and in nature ; their inquiries must of force have been of a far other kind than they are.

For doth any of them, in handling quantity, speak of the force of union, how, and how far it multiplieth virtue? Doth any give the reason, why some things in nature are so common and in so great mass, and others so rare, and in so small quantity? Doth any, in handling similitude and diversity, assign the cause why iron should not move to iron, which is more like, but move to the loadstone, which is less like? Why, in all diversities of things, there should be certain participles in nature, which are almost ambiguous, to which kind they should be referred? But there is a mere and deep silence touching the nature and operation of those common adjuncts of things, as in nature ; and only a resuming and repeating of the force and use of them, in speech or argument.

Therefore because in a writing of this nature I avoid all subtilty, my meaning touching this original or universal philosophy is thus, in a plain and gross description by negative ; "That it be a receptacle for all such profitable observations and axioms, as fall not within the compass of any of the special parts of philosophy or sciences, but are more common and of a higher stage."

Now that there are many of that kind, need not to be doubted. For example : is not the rule, "*Si inæqualibus æqualia addas, omnia erunt inæqualia*," an axiom as well of justice as of the mathematics? And is there not a true coincidence between commutative and distributive justice, and arithmetical and geometrical proportion? Is not that other rule, "*Quæ in eodem tertio conveniunt, et inter se conveniunt*," a rule taken from the mathematics, but so potent in logic, as all syllogisms are built upon it? Is not the observation, "*Omnia mutantur, nil interit*," a contemplation in philosophy thus, that the *quantum* of nature is eternal? in natural theology thus ; that it requireth the same omnipotence to make somewhat nothing, which at the first made nothing somewhat? according to the Scripture, "*Didici quod omnia opera, quæ fecit Deus, perseverent in perpetuum ; non possumus eis quicquam addere, nec auferre*."

Is not the ground, which Machiavel wisely and largely discourseth concerning governments, that the way to establish and preserve them, is to reduce them *ad principia* ; a rule in religion and nature, as well as in civil administration? Was not the Persian magic a reduction or correspondence of the principles and architectures of nature, to the rules and policy of governments? Is not the precept of a musician,

to fall from a discord or harsh accord upon a concord or sweet accord, alike true in affection? Is not the trope of music, to avoid or slide from the close or cadence, common with the trope of rhetoric, of deceiving expectation? Is not the delight of the quavering upon a stop in music, the same with the playing of light upon the water?

————— Splendet tremulo sub lumine pontus.

Are not the organs of the senses of one kind with the organs of reflection, the eye with a glass, the ear with a cave or strait determined and bounded? Neither are these only similitudes, as men of narrow observation may conceive them to be, but the same footsteps of nature, treading or printing upon several subjects or matters.

This science therefore, as I understand it, I may justly report as deficient; for I see sometimes the profounder sort of wits, in handling some particular argument, will now and then draw a bucket of water out of this well for their present use; but the springhead thereof seemeth to me not to have been visited; being of so excellent use, both for the disclosing of nature, and the abridgment of art.

This science being therefore first placed as a common parent, like unto Berecynthia, which had so much heavenly issue, "*Omnes cœlicolas, omnes supera alta tenentes*," we may return to the former distribution of the three philosophies, divine, natural, and human.

And as concerning divine philosophy, or Natural Theology, it is that knowledge or rudiment of knowledge concerning God, which may be obtained by the contemplation of his creatures; which knowledge may be truly termed divine, in respect of the object, and natural in respect of the light.

The bounds of this knowledge are, that it sufficeth to convince atheism, but not to inform religion: and therefore there was never miracle wrought by God to convert an atheist, because the light of nature might have led him to confess a God: but miracles have been wrought to convert idolaters and the superstitious, because no light of nature extendeth to declare the will and true worship of God.

For as all works do show forth the power and skill of the workman, and not his image, so it is of the works of God, which do show the omnipotency and wisdom of the Maker, but not his image: and therefore therein the heathen opinion differeth from the sacred truth; for they supposed the world to be the image of God, and man to be an extract or compendious image of the world; but the Scriptures never vouchsafe to attribute to the world that honour, as to be the image of God, but only the work of his hands; neither do they speak of any other image of God, but man: wherefore by the contemplation of nature, to induce and enforce the acknowledgment of God, and to demonstrate his power, providence, and goodness, is an excellent argument, and hath been excellently handled by divers.

But on the other side, out of the contemplation of nature or ground of human knowledges, to induce any verity or persuasion concerning the points of faith, is in my judgment not safe: "*Da fidei, quæ fidei sunt.*" For the heathen themselves conclude as much in that excellent

and divine fable of the golden chain ; "That men and gods were not able to draw Jupiter down to the earth ; but contrariwise, Jupiter was able to draw them up to heaven."

So as we ought not to attempt to draw down or submit the mysteries of God to our reason ; but contrariwise, to raise and advance our reason to the divine truth. So as in this part of knowledge, touching divine philosophy, I am so far from noting any deficiency, as I rather note an excess ; whereunto I have digressed, because of the extreme prejudice which both religion and philosophy hath received, and may receive, by being commixed together ; as that which undoubtedly will make an heretical religion, and an imaginary and fabulous philosophy.

Otherwise it is of the nature of angels and spirits, which is an appendix of theology, both divine and natural, and is neither inscrutable nor interdicted : for although the Scripture saith, "Let no man deceive you in sublime discourse touching the worship of angels, pressing into that he knoweth not," etc., yet notwithstanding, if you observe well that precept, it may appear thereby that there be two things only forbidden, adoration of them, and opinion fantastical of them, either to extol them farther than appertaineth to the degree of a creature, or to extol a man's knowledge of them farther than he hath ground. But the sober and grounded inquiry, which may arise out of the passages of Holy Scriptures, or out of the gradations of nature, is not restrained. So of degenerate and revolted spirits, the conversing with them, or the employment of them, is prohibited, much more any veneration towards them. But the contemplation or science of their nature, their power, their illusions, either by Scripture or reason, is a part of spiritual wisdom. For so the apostle saith, "We are not ignorant of his stratagems." And it is no more unlawful to inquire the nature of evil spirits, than to inquire the force of poisons in nature, or the nature of sin and vice in morality. But this part, touching angels and spirits, I cannot note as deficient, for many have occupied themselves in it : I may rather challenge it, in many of the writers thereof, as fabulous and fantastical.

LEAVING therefore divine philosophy or natural theology, not divinity, or inspired theology, which we reserve for the last of all, as the haven and sabbath of all man's contemplations, we will now proceed to Natural Philosophy.

If then it be true that Democritus said, "That the truth of nature lieth hid in certain deep mines and caves:" and if it be true likewise, that the alchemists do so much inculcate, that Vulcan is a second nature, and imitateth that dexterously and compendiously, which nature worketh by ambages and length of time ; it were good to divide natural philosophy into the mine and the furnace, and to make two professions or occupations of natural philosophers, some to be pioneers, and some smiths ; some to dig, and some to refine and hammer : and surely I do best allow of a division of that kind, though in more familiar and scholastical terms : namely, that these be the two parts of natural

philosophy, the inquisition of causes, and the production of effects : speculative and operative ; natural science, and natural prudence.

For as in civil matters there is a wisdom of discourse, and a wisdom of direction ; so is it in natural. And here I will make a request, that for the latter, or at least for a part thereof, I may revive and reintegrate the misapplied and abused name of natural magic, which, in the true sense, is but natural wisdom, or natural prudence ; taken according to the ancient acception, purged from vanity and superstition.

Now although it be true, and I know it well, that there is an intercourse between causes and effects, so as both these knowledges, speculative and operative, have a great connexion between themselves ; yet because all true and fruitful natural philosophy hath a double scale or ladder, ascendent and descendent ; ascending from experiments, to the invention of causes ; and descending from causes, to the invention of new experiments ; therefore I judge it most requisite that these two parts be severally considered and handled.

Natural science, or theory, is divided into Physic and Metaphysic ; wherein I desire it may be conceived, that I use the word Metaphysic in a differing sense from that that is received : and, in like manner, I doubt not but it will easily appear to men of judgment, that in this and other particulars, wheresoever my conception and notion may differ from the ancient, yet I am studious to keep the ancient terms.

For hoping well to deliver myself from mistaking, by the order and perspicuous expressing of that I do propound ; I am otherwise zealous and affectionate to recede as little from antiquity, either in terms or opinions, as may stand with truth, and the proficiencie of knowledge.

And herein I cannot a little marvel at the philosopher Aristotle that did proceed in such a spirit of difference and contradiction toward's all antiquity, undertaking not only to frame new words of science at pleasure, but to confound and extinguish all ancient wisdom : insomuch as he never nameth or mentioneth an ancient author or opinion, but to confute and reprove ; wherein for glory, and drawing followers and disciples, he took the right course.

For certainly there cometh to pass, and hath place in human truth, that which was noted and pronounced in the highest truth, "*Veni in nomine Patris, nec recipitis me ; si quis venerit in nomine suo, eum recipietis.*" But in this divine aphorism, considering to whom it was applied, namely to Antichrist, the highest deceiver, we may discern well, that the coming in a man's own name, without regard of antiquity or paternity, is no good sign of truth, although it be joined with the fortune and success of an "*Eum recipietis.*"

But for this excellent person, Aristotle, I will think of him, that he learned that humour of his scholar, with whom, it seemeth, he did emulate, the one to conquer all opinions, as the other to conquer all nations : wherein nevertheless, it may be, he may at some men's hands, that are of a bitter disposition, get a like title as his scholar did.

*Felix terrarum prædo, non utile mundo
Editus exemplum, etc.*

So

Felix doctrinæ prædo.

But to me, on the other side, that do desire as much as lieth in my pen to ground a sociable intercourse between antiquity and proficience, it seemeth best to keep way with antiquity *usque ad aras*; and therefore to retain the ancient terms, though I sometimes alter the uses and definitions; according to the moderate proceeding in civil government, where although there be some alteration, yet that holdeth which Tacitus wisely noteth, "*eadem magistratuum vocabula.*"

To return therefore to the use and acception of the term metaphysic, as I do now understand the word; it appeareth, by that which hath been already said, that I intend *philosophia prima*, summary philosophy, and metaphysic, which heretofore have been confounded as one, to be two distinct things. For the one I have made as a parent, or common ancestor, to all knowledge; and the other I have now brought in, as a branch, or descendent, of natural science. It appeareth likewise that I have assigned to summary philosophy the common principles and axioms which are promiscuous and indifferent to several sciences: I have assigned unto it likewise the inquiry touching the operation of the relative and adventive characters of essences, as quantity, similitude, diversity, possibility, and the rest; with this distinction and provision; that they be handled as they have efficacy in nature, and not logically. It appeareth likewise, that natural theology, which heretofore hath been handled confusedly with metaphysic, I have inclosed and bounded by itself.

It is therefore now a question, what is left remaining for metaphysic; wherein I may without prejudice preserve thus much of the conceit of antiquity, that physic should contemplate that which is inherent in matter, and therefore transitory; and metaphysic, that which is abstracted and fixed.

And again, that physic should handle that which supposeth in nature only a being and moving; and metaphysic should handle that which supposeth farther in nature a reason, understanding, and platform. But the difference perspicuously expressed, is most familiar and sensible.

For as we divided natural philosophy in general into the inquiry of causes, and productions of effects; so that part which concerneth the inquiry of causes, we do subdivide according to the received and sound division of causes; the one part which is physic, inquireth and handleth the material and efficient causes; and the other, which is metaphysic, handleth the formal and final causes.

Physic, taking it according to the derivation, and not according to our idiom for medicine, is situate in a middle term, or distance, between natural history and metaphysic. For natural history describeth the variety of things, physic the causes, but variable or respective causes; and metaphysic, has fixed and constant causes.

*Limus ut hic durescit, et hæc ut cera quiescit,
Uno eodemque igni.*

Fire is the cause of induration, but respective to clay: fire is the cause of colliquation, but respective to wax. But fire is no constant cause

either of induration or colliquation: so then the physical causes are but the efficient and the matter.

Physic hath three parts, whereof two respect nature united or collected, the third contemplateth nature diffused or distributed.

Nature is collected either into one entire total, or else into the same principles or seeds. So as the first doctrine is touching the contexture or configuration of things, as *de mundo, de universitate rerum*.

The second is the doctrine concerning the principles or originals of things.

The third is the doctrine concerning all variety and particularity of things; whether it be of the differing substances, or their differing qualities and natures; whereof there needeth no enumeration, this part being but as a gloss, or paraphrase, that attendeth upon the text of natural history.

Of these three I cannot report any as deficient. In what truth or perfection they are handled, I make not now any judgment: but they are parts of knowledge not deserted by the labour of men.

For Metaphysic, we have assigned unto it the inquiry of formal and final causes; which assignation, as to the former of them, may seem to be nugatory and void, because of the received and inveterate opinion, that the inquisition of man is not competent to find out essential forms, or true differences: of which opinion we will take this hold, that the invention of forms is of all other parts of knowledge the worthiest to be sought, if it be possible to be found.

As for the possibility, they are ill discoverers that think there is no land, when they can see nothing but sea.

But it is manifest, that Plato, in his opinion of ideas, as one that had a wit of elevation situate as upon a cliff, did descry, "That forms were the true object of knowledge;" but lost the real fruit of his opinion, by considering of forms as absolutely abstracted from matter, and not confined and determined by matter; and so turning his opinion upon theology, wherewith all his natural philosophy is infected.

But if any man shall keep a continual watchful and severe eye upon action, operation, and the use of knowledge, he may advise and take notice what are the forms, the disclosures whereof are fruitful and important to the state of man. For as to the forms of substances, man only except, of whom it is said, "*Formavit hominem de limo terræ, et spiravit in faciem ejus spiraculum vitæ,*" and not as of all other creatures, "*Producant aquæ, producat terra;*" the forms of substances, I say, as they are now by compounding and transplanting multiplied, are so perplexed, as they are not to be inquired; no more than it were either possible or to purpose, to seek in gross the forms of those sounds which make words, which by composition and transposition of letters are infinite.

But, on the other side, to inquire the form of those sounds or voices, which make simple letters, is easily comprehensible; and being known, induceth and manifesteth the forms of words, which consist and are compounded of them. In the same manner to inquire the form of a

lion, of an oak, of gold ; nay, of water, of air, is a vain pursuit : but to inquire the forms of sense, of voluntary motion, of vegetation, of colours, of gravity and levity, of density, of tenuity, of heat, of cold, and all other natures and qualities, which, like an alphabet, are not many, and of which the essences, upheld by matter, of all creatures do consist : to inquire, I say, the true forms of these, is that part of metaphysic which we now define of.

Not but that physick doth make inquiry, and take consideration of the same natures : but how ? Only as to the material and efficient causes of them, and not as to the forms. For example ; if the cause of whiteness in snow or froth be inquired, and it be rendered thus ; that the subtile intermixture of air and water is the cause, it is well rendered ; but nevertheless, is this the form of whiteness ? No ; but it is the efficient, which is ever but *vehiculum formæ*.

This part of metaphysic I do not find laboured and performed, whereat I marvel not : because I hold it not possible to be invented by that course of invention which hath been used, in regard that men, which is the root of all error, have made too untimely a departure, and too remote a recess from particulars.

But the use of this part of metaphysic which I report as deficient, is of the rest the most excellent in two respects : the one, because it is the duty and virtue of all knowledge to abridge the infinity of individual experience, as much as the conception of truth will permit, and to remedy the complaint of *vita brevis, ars longa* ; which is performed by uniting the notions and conceptions of sciences : for knowledges are as pyramids, whereof history is the basis. So of natural philosophy, the basis is natural history ; the stage next the basis is physick ; the stage next the vertical point is metaphysic. As for the vertical point, "Opus quod operatur Deus a principio usque ad finem," the summary law of nature, we know not whether man's inquiry can attain unto it. But these three be the true stages of knowledge, and are to them that are depraved no better than the giants' hills.

Ter sunt conati imponere Pelio Ossam

Scilicet, atque Ossæ frondosum involvere Olympum.

But to those which refer all things to the glory of God, they are as the three acclamations, *Sancte, sancte, sancte* ; holy in the description, or dilatation of his works ; holy in the connexion or concatenation of them ; and holy in the union of them in a perpetual and uniform law.

And therefore the speculation was excellent in Parmenides and Plato, although but a speculation in them, that all things by scale did ascend to unity. So then always that knowledge is worthiest, which is charged with the least multiplicity ; which appeareth to be metaphysic, as that which considereth the simple forms or differences of things, which are few in number, and the degrees and co-ordinations whereof make all this variety.

The second respect which valueth and commendeth this part of metaphysic is, that it doth enfranchise the power of man unto the greatest liberty and possibility of works and effects. For physick

carrieth men in narrow and restrained ways, subject to many accidents of impediments, imitating the ordinary flexuous courses of nature ; but "latæ undique sunt sapientibus viæ:" to sapience, which was anciently defined to be "*rerum divinarum et humanarum scientia*," there is ever choice of means : for physical causes give light to new invention *in simili materia*. But whosoever knoweth any form, knoweth the utmost possibility of super-inducing that nature upon any variety of matter, and so is less restrained in operation, either to the basis of the matter, or the condition of the efficient : which kind of knowledge Solomon likewise, though in a more divine sense, elegantly describeth : "Non arctabuntur gressus tui, et currens non habebis offendiculum." The ways of sapience are not much liable either to particularity or chance.

The second part of metaphysic is the inquiry of final causes, which I am moved to report, not as omitted, but as misplaced ; and yet if it were but a fault in order, I would not speak of it : for order is matter of illustration, but pertaineth not to the substance of sciences. But this misplacing hath caused a deficiency, or at least a great improficiency in the sciences themselves. For the handling of final causes, mixed with the rest in physical inquiries, hath intercepted the severe and diligent inquiry of all real and physical causes, and given men the occasion to stay upon these satisfactory and specious causes, to the great arrest and prejudice of farther discovery.

For this I find done not only by Plato, who ever anchoreth upon that shore, but by Aristotle, Galen, and others, which do usually likewise fall upon these flats of discoursing causes. For to say that the hairs of the eyelids are for a quickset and fence about the sight ; or, that the firmness of the skins and hides of living creatures is to defend them from the extremities of heat or cold ; or, that the bones are for the columns or beams, whereupon the frame of the bodies of living creatures are built ; or, that the leaves of trees are for the protecting of the fruit ; or, that the clouds are for watering of the earth ; or, that the solidness of the earth is for the station and mansion of living creatures, and the like, is well inquired and collected in metaphysic ; but in physic they are impertinent. Nay, they are indeed but remoras and hinderances to stay and slug the ship from farther sailing, and have brought this to pass, that the search of the physical causes hath been neglected, and passed in silence.

And therefore the natural philosophy of Democritus, and some others, who did not suppose a mind or reason in the frame of things, but attributed the form thereof, able to maintain itself, to infinite essays or proofs of nature, which they term fortune : seemeth to me, as far as I can judge by the recital and fragments which remain unto us, in particularities of physical causes, more real and better inquired than that of Aristotle and Plato ; whereof both intermingled final causes, the one as a part of theology, the other as a part of logic, which were the favourite studies respectively of both those persons. Not because those final causes are not true, and worthy to be inquired, being kept within their own province ; but because their excursions into the

limits of physical causes hath bred a vastness and solitude in that track. For, otherwise, keeping their precincts and borders, men are extremely deceived if they think there is an enmity or repugnancy at all between them. For the cause rendered, that the hairs about the eye-lids are for the safeguard of the sight, doth not impugn the cause rendered, that pilosity is incident to orifices of moisture; *Muscosi fontes*, etc. Nor the cause rendered, that the firmness of hides is for the armour of the body against extremities of heat or cold, doth not impugn the cause rendered, that contraction of pores is incident to the outwardest parts, in regard of their adjacence to foreign or unlike bodies; and so of the rest: both causes being true and compatible, the one declaring an intention, the other a consequence only.

Neither doth this call in question, or derogate from divine providence, but highly confirm and exalt it. For as in civil actions he is the greater and deeper politician, that can make other men the instruments of his will and ends, and yet never acquaint them with his purpose, so as they shall do it, and yet not know what they do; than he that imparteth his meaning to those he employeth: so is the wisdom of God more admirable, when nature intendeth one thing, and providence draweth forth another; than if he had communicated to particular creatures, and motions, the characters and impressions of his providence. And thus much for metaphysics; the latter part whereof I allow as extant, but wish it confined to its proper place.

Nevertheless there remaineth yet another part of natural philosophy, which is commonly made a principal part, and holdeth rank with phisic special, and metaphysic, which is mathematic; but I think it more agreeable to the nature of things, and to the light of order, to place it as a branch of metaphysic: for the subject of it being quantity, not quantity indefinite, which is but a relative, and belongeth to *philosophia prima*, as hath been said, but quantity determined, or proportionable; it appeareth to be one of the essential forms of things; as that that is causative in nature of a number of effects: insomuch as we see, in the schools both of Democritus and Pythagoras, that the one did ascribe Figure to the first seeds of things, and the other did suppose Numbers to be the principles and originals of things; and it is true also, that of all other forms, as we understand forms, it is the most abstracted and separable from matter, and therefore most proper to metaphysic; which hath likewise been the cause why it hath been better laboured and inquired, than any of the other forms, which are more immersed into matter.

For it being the nature of the mind of man, to the extreme prejudice of knowledge, to delight in the spacious liberty of generalities, as in a champaign region, and not in the inclosures of particularity; the mathematics of all other knowledge were the goodliest fields to satisfy the appetite.

But for the placing of these sciences, it is not much material; only we have endeavoured, in these our partitions, to observe a kind of perspective, that one part may cast light upon another.

The Mathematics are either pure or mixed. To the pure mathe-

matics are those sciences belonging which handle quantity determinate, merely severed from any axioms of natural philosophy; and these are two, Geometry, and Arithmetic; the one handling quantity continued, and the other dissevered.

Mixed hath for subject some axioms or parts of natural philosophy and considereth quantity determined, as it is auxiliary and incident unto them.

For many parts of nature can neither be invented with sufficient subtilty, nor demonstrated with sufficient perspicuity, nor accommodated unto use with sufficient dexterity, without the aid and inter-vening of the mathematics; of which sort are perspective, music, astronomy, cosmography, architecture, enginery, and divers others.

In the mathematics I can report no deficiency, except it be that men do not sufficiently understand the excellent use of the pure mathematics, in that they do remedy and cure many defects in the wit and faculties intellectual. For, if the wit be dull, they sharpen it; if too wandering, they fix it; if too inherent in the sense, they abstract it. So that as tennis is a game of no use in itself, but of great use in respect it maketh a quick eye, and a body ready to put itself into all postures; so in the mathematics, that use which is collateral and inter-venient, is no less worthy than that which is principal and intended.

And as for the mixed mathematics, I may only make this prediction, that there cannot fail to be more kinds of them as nature grows further disclosed.

Thus much of natural science, or the part of nature speculative.

For Natural Prudence, or the part operative of natural philosophy, we will divide it into three parts, experimental, philosophical, and magical; which three parts active have a correspondence and analogy with the three parts speculative, natural history, physic, and metaphysic; for many operations have been invented sometimes by a casual incidence and occurrence, sometimes by a purposed experiment; and of those which have been found by an intentional experiment, some have been found out by varying or extending the same experiment, some by transferring and compounding divers experiments, the one into the other, which kind of invention an empiric may manage.

Again, by the knowledge of physical causes, there cannot fail to follow many indications and designations of new particulars, if men in their speculation will keep one eye upon use and practice. But these are but coastings along the shore, *premendo littus iniquum*: for, it seemeth to me, there can hardly be discovered any radical or fundamental alterations and innovations in nature, either by the fortune and essays of experiments, or by the light and direction of physical causes.

If therefore we have reported metaphysic deficient, it must follow, that we do the like of natural magic, which hath relation thereunto. For as for the natural magic whereof now there is mention in books, containing certain credulous and superstitious conceits and observations of sympathies, and antipathies, and hidden proprieties, and some

frivolous experiments, strange rather by disguisement, than in themselves : it is as far differing in truth of nature from such a knowledge as we require, as the story of King Arthur of Britain, or Hugh of Bourdeaux, differs from Cæsar's commentaries in truth of story. For it is manifest that Cæsar did greater things *de vero*, than those imaginary heroes were feigned to do ; but he did them not in that fabulous manner. Of this kind of learning the fable of Ixion was a figure, who designed to enjoy Juno, the goddess of power ; and instead of her had copulation with a cloud, of which mixture were begotten centaurs and chimeras.

So whosoever shall entertain high and vaporous imaginations, instead of a laborious and sober inquiry of truth, shall beget hopes and beliefs of strange and impossible shapes. And therefore we may note in these sciences, which hold so much of imagination and belief, as this degenerate natural magic, alchemy, astrology, and the like, that, in their propositions, the description of the means is ever more monstrous than the pretence or end.

For it is a thing more probable, that he that knoweth well the natures of weight, of colour, of pliant and fragile in respect of the hammer, of volatile and fixed in respect of the fire, and the rest, may superinduce upon some metal the nature and form of gold by such mechanic as longeth to the production of the natures afore rehearsed, than that some grains of the medicine projected should in a few moments of time turn a sea of quicksilver, or other material, into gold : so it is more probable, that he, that knoweth the nature of arefaction, the nature of assimilation, of nourishment to the thing nourished, the manner of increase and clearing of spirits, the manner of the depredations which spirits make upon the humours and solid parts ; shall, by ambages of diets, bathings, anointings, medicines, motions, and the like, prolong life, or restore some degree of youth or vivacity, than that it can be done with the use of a few drops, or scruples of a liquor or receipt. To conclude therefore, the true natural magic, which is that great liberty and latitude of operation which dependeth upon the knowledge of forms, I may report deficient, as the relative thereof is ; to which part, if we be serious, and incline not to vanities and plausible discourse, besides the deriving and deducing the operations themselves from metaphysic, there are pertinent two points of much purpose, the one by way of preparation, the other by way of caution : the first is, that there be made a kalendar resembling an inventory of the estate of man, containing all the inventions, being the works or fruits of nature or art, which are now extant, and whereof man is already possessed, out of which doth naturally result a note, what things are yet held impossible or not invented : which kalendar will be the more artificial and serviceable, if to every reputed impossibility you add what thing is extant, which cometh the nearest in degree to that impossibility ; to the end, that by these optatives and potentials man's inquiry may be the more awake in deducing direction of works from the speculation of causes ; and secondly, that those experiments be not only esteemed which have an immediate and present

use, but those principally which are of most universal consequence for invention of other experiments, and those which give most light to the invention of causes : for the invention of the mariner's needle, which giveth the direction, is of no less benefit for navigation, than the invention of the sails, which give the motion.

Thus have I passed through natural philosophy, and the deficiencies thereof, wherein if I have differed from the ancient and received doctrines, and thereby shall move contradiction ; for my part as I affect not to dissent, so I purpose not to contend. If it be truth,

Non canimus surdis, respondent omnia sylvæ :

the voice of nature will consent, whether the voice of man do or no. And as Alexander Borgia was wont to say of the expedition of the French for Naples, that they came with chalk in their hande to mark up their lodgings, and not with weapons to fight : so I like better that entry of truth, which cometh peaceably with chalk to mark up those minds which are capable to lodge and harbour it, than that which cometh with pugnacity and contention.

But there remaineth a division of natural philosophy according to the report of the inquiry, and nothing concerning the matter or subject ; and that is positive and considerative ; when the inquiry reporteth either an assertion, or a doubt. These doubts, or *non liquets*, are of two sorts, particular, and total. For the first, we see a good example thereof in Aristotle's Problems, which deserved to have had a better continuance ; but so nevertheless, as there is one point whereof warning is to be given and taken. The registering of doubts hath two excellent uses : the one, that it saveth philosophy from errors and falsehoods, when that which is not fully appearing is not collected into assertion, whereby error might draw error, but reserved in doubt. The other, that the entry of doubts are as so many suckers or sponges to draw use of knowledge ; insomuch, as that which, if doubts had not preceded, a man should never have advised, but passed it over without note, by the suggestion and solicitation of doubts is made to be attended and applied. But both these commodities do scarcely countervail an inconvenience which will intrude itself, if not debarred ; which is, that, when a doubt is once received, men labour rather how to keep it a doubt still, than how to solve it, and accordingly bend their wits. Of this we see the familiar example in lawyers and scholars, both which, if they have once admitted a doubt, it goeth ever after authorized for a doubt. But that use of wit and knowledge is to be allowed, which laboureth to make doubtful things certain, and not those which labour to make certain things doubtful. Therefore these kalendars of doubts I commend as excellent things, so that there be this caution used, that when they be thoroughly sifted and brought to resolution, they be from thenceforth omitted, discarded, and not continued to cherish and encouragement in doubting. To which kalendar of doubts or problems, I advise to be annexed another kalendar. as much or more material, which is a kalendar of popular errors, I mean chiefly in natural history, such as pass in speech and conceit, and are nevertheless detected and convicted of

untruth, that man's knowledge be not weakened nor embased by such dross and vanity.

As for the doubts or *non liquets* general or in total, I understand these differences of opinions touching the principles of nature, and the fundamental points of the same, which have caused the diversity of sects, schools, and philosophies, as that of Empedocles, Pythagoras, Democritus, Parmenides, and the rest. For although Aristotle, as though he had been of the race of the Ottomans, thought he could not reign, except the first thing he did he killed all his brethren; yet to those that seek truth and not magistrality, it cannot but seem a matter of great profit, to see before them the several opinions touching the foundations of nature: not for any exact truth that can be expected in those theories: for as the same phænomena in astronomy are satisfied by the received astronomy of the diurnal motion and the proper motions of the planets, with their eccentrics, and epicycles; and likewise by the theory of Copernicus, who supposed the earth to move, and the calculations are indifferently agreeable to both: so the ordinary face and view of experience is many times satisfied by several theories and philosophies; whereas to find the real truth requireth another manner of severity and attention. For, as Aristotle saith, that children at the first will call every woman mother, but afterwards they come to distinguish according to truth: so experience, if it be in childhood, will call every philosophy mother, but when it cometh to ripeness it will discern the true mother; so as in the mean-time it is good to see the several glosses and opinions upon nature, whereof it may be every one in some one point hath seen clearer than his fellows; therefore I wish some collection to be made painfully and understandingly *de antiquis philosophiis*, out of all the possible light which remaineth to us of them: which kind of work I find deficient. But here I must give warning, that it be done distinctly and severally, the philosophies of every one throughout by themselves, and not by titles packed and fagotted up together, as hath been done by Plutarch. For it is the harmony of a philosophy itself, which giveth it light and credence; whereas if it be singled and broken, it will seem more foreign and dissonant. For as when I read in Tacitus the actions of Nero or Claudius, with circumstances of times, inducements and occasions, I find them not so strange; but when I read them in Suetonius Tranquillus, gathered into titles and bundles, and not in order of time they seem more monstrous and incredible; so it is of any philosophy reported entire, and dismembered by articles. Neither do I exclude opinions of latter times to be likewise represented in this kalendar of sects of philosophy, as that of Theophrastus Paracelsus, eloquently reduced into an harmony by the pen of Severinus the Dane, and that of Tilesius, and his scholar Donius, being as a pastoral philosophy, full of sense, but of no great depth; and that of Fracastorius, who though he pretended not to make any new philosophy, yet did use the absoluteness of his own sense upon the old: and that of Gilbertus, our countryman, who revived, with some alterations and demonstrations, the opinions of Xenophanes: and any other worthy to be admitted.

Thus have we now dealt with two of the three beams of man's knowledge, that is *Radius directus*, which is referred to nature; *Radius refractus*, which is referred to God, and cannot report truly because of the inequality of the medium; there resteth *Radius reflexus*, whereby man beholdeth and contemplateth himself.

WE come therefore now to that knowledge whereunto the ancient oracle directeth us, which is the knowledge of ourselves; which deserveth the more accurate handling, by how much it toucheth us more nearly. This knowledge, as it is the end and term of natural philosophy in the intention of man, so, notwithstanding, it is but a portion of natural philosophy in the continent of nature; and generally let this be a rule, that all partitions of knowledges be accepted rather for lines and veins, than for sections and separations; and that the continuance and entireness of knowledge be preserved. For the contrary hereof hath made particular sciences to become barren, shallow, and erroneous, while they have not been nourished and maintained from the common fountain. So we see Cicero the orator complained of Socrates and his school, that he was the first that separated philosophy and rhetoric, whereupon rhetoric became an empty and verbal art. So we may see, that the opinion of Copernicus touching the rotation of the earth, which astronomy itself cannot correct, because it is not repugnant to any of the phænomena, yet natural philosophy may correct. So we see also that the science of medicine, if it be destitute and forsaken by natural philosophy, it is not much better than an empirical practice.

With this reservation therefore we proceed to Human Philosophy, or humanity, which hath two parts: the one considereth a man segregate or distributively; the other congregate or in society. So as human philosophy is either simple and particular, or conjugate and civil. Humanity particular consisteth of the same parts whereof man consisteth, that is, of knowledges which respect the body, and of knowledges that respect the mind; but before we distribute so far, it is good to constitute. For I do take the consideration in general, and at large, of human nature to be fit to be emancipated and made a knowledge by itself; not so much in regard to those delightful and elegant discourses which have been made of the dignity of man, of his miseries, of his state and life, and the like adjuncts of his common and undivided nature; but chiefly in regard of the knowledge concerning the sympathies and concordances between the mind and body, which being mixed, cannot be properly assigned to the sciences of either.

This knowledge hath two branches: for as all leagues and amities consist of mutual intelligence and mutual offices, so this league of mind and body hath these two parts, how the one discloseth the other, and how the one worketh upon the other; Discovery, and Impression.

The former of these hath begotten two arts, both of prediction or prenotation, whereof the one is honoured with the inquiry of Aristotle, and the other of Hippocrates. And although they have of later time been used to be coupled with superstitious and fantastical arts, yet

being purged and restored to their true state, they have both of them a solid ground in nature, and a profitable use in life. The first is physiognomy, which discovereth the disposition of the mind by the lineaments of the body. The second is the exposition of natural dreams, which discovereth the state of the body by the imaginations of the mind. In the former of these I note a deficiency, for Aristotle hath very ingeniously and diligently handled the fractures of the body, but not the gestures of the body, which are no less comprehensible by art, and of greater use and advantage. For the lineaments of the body do disclose the disposition and inclination of the mind in general; but the motions of the countenance and parts do not only so, but do farther disclose the present humour and state of the mind and will. For, as your majesty saith most aptly and elegantly, "As the tongue speaketh to the ear, so the gesture speaketh to the eye." And therefore a number of subtle persons, whose eyes do dwell upon the faces and fashions of men, do well know the advantage of this observation, as being most part of their ability; neither can it be denied but that it is a great discoverer of dissimulations, and a great direction in business.

The latter branch, touching impression, hath not been collected into art, but hath been handled dispersedly; and it hath the same relation or antistrophe that the former hath. For the consideration is double; "Either how, and how far the humours and effects of the body do alter or work upon the mind; or again, How, and how far the passions or apprehensions of the mind do alter or work upon the body." The former of these hath been inquired and considered, as a part and appendix of medicine, but much more as a part of religion or superstition; for the physician prescribeth cures of the mind in frenzies and melancholy passions, and pretendeth also to exhibit medicines to exhilarate the mind, to confirm the courage, to clarify the wits, to corroborate the memory, and the like: but the scruples and superstitions of diet, and other regiment of the body, in the sect of the Pythagoreans, in the heresy of the Manicheans, and in the law of Mahomet, do exceed: so likewise the ordinances in the ceremonial law, interdicting the eating of the blood and the fat, distinguishing between beasts clean and unclean for meat, are many and strict. Nay, the faith itself, being clear and serene from all clouds of ceremony, yet retaineth the use of fastings, abstinences, and other macerations and humiliations of the body, as things real and not figurative. The root and life of all which prescripts is, besides the ceremony, the consideration of that dependency which the affections of the mind are submitted unto upon the state and disposition of the body. And if any man of weak judgment do conceive, that this suffering of the mind from the body, doth either question the immortality, or derogate from the sovereignty of the soul, he may be taught in easy instances, that the infant in the mother's womb is compatible with the mother, and yet separable: and the most absolute monarch is sometimes led by his servants, and yet without subjection. As for the reciprocal knowledge, which is the operation of the conceits and passions of the mind upon the body; we see all

wise physicians in their prescriptions of their regiments, to their patients, do ever consider *accidentia animi*, as of great force to further or hinder remedies, or recoveries; and more especially it is an inquiry of great depth and worth concerning imagination, how, and how far it altereth the body proper of the imaginant. For although it hath a manifest power to hurt, it followeth not it hath the same degree of power to help; no more than a man can conclude, that because there be pestilent airs, able suddenly to kill a man in health, therefore there should be sovereign airs, able suddenly to cure a man in sickness. But the inquisition of this part is of great use, though it needeth, as Socrates said, "a Delian diver," being difficult and profound. But unto all this knowledge *de communi vinculo*, of the concordances between the mind and the body, that part of inquiry is most necessary, which considereth of the seats and domiciles, which the several faculties of the mind do take and occupate in the organs of the body; which knowledge hath been attempted, and is controverted, and deserveth to be much better inquired. For the opinion of Plato, who placed the understanding in the brain, animosity (which he did unfitly call anger, having a greater mixture with pride) in the heart, and concupiscence or sensuality in the liver, deserveth not to be despised, but much less to be allowed. So then we have constituted, as in our own wish and advice, the inquiry touching human nature entire, as a just portion of knowledge to be handled apart.

The knowledge that concerneth man's Body, is divided as the good of man's body is divided, unto which it referreth. The good of man's body is of four kinds, health, beauty, strength, and pleasure: so the knowledges are medicine, or art of cure; art of decoration, which is called cosmetic; art of activity, which is called athletic; and art voluptuary, which Tacitus truly calleth "*eruditus luxus*." This subject of man's body is of all other things in nature most susceptible of remedy; but then that remedy is most susceptible of error. For the same subtilty of the subject doth cause large possibility, and easy failing; and therefore the inquiry ought to be the more exact.

To speak therefore of medicine, and to resume that we have said, ascending a little higher; the ancient opinion that man was *microcosmus*, an abstract or model of the world, hath been fantastically strained by Paracelsus and the alchemists, as if there were to be found in man's body certain correspondences and parallels, which should have respect to all varieties of things, as stars, planets, minerals, which are extant in the great world. But thus much is evidently true, that of all substances which nature hath produced, man's body is the most extremely compounded: For we see herbs and plants are nourished by earth and water; beasts for the most part by herbs and fruits; man by the flesh of beasts, birds, fishes, herbs, grains, fruits, water, and the manifold alterations, dressings, and preparations of these several bodies, before they come to be his food and aliment. Add hereunto, that beasts have a more simple order of life, and less change of affections to work upon their bodies; whereas man, in his mansion, sleep, exercise, passions, hath infinite variations; and it cannot be denied, but that the body of man of all other things is of the most

compounded mass. The soul on the other side is the simplest of substances, as is well expressed :

———Purumque reliquit
Æthereum sensum, atque aurâ simplicis ignem.

So that it is no marvel though the soul so placed enjoy no rest, if that principle be true, that “*Motus rerum est rapidus extra locum, placidus in loco.*” But to the purpose : this variable composition of man’s body hath made it as an instrument easy to distemper, and therefore the poets did well to conjoin music and medicine in Apollo, because the office of medicine is but to tune this curious harp of man’s body, and to reduce it to harmony. So then the subject being so variable, hath made the art by consequence more conjectural ; and the art being conjectural, hath made so much the more place to be left for imposture. For almost all other arts and sciences are judged by acts or master-pieces, as I may term them, and not by the successes and events. The lawyer is judged by the virtue of his pleading, and not by the issue of the cause. The master of the ship is judged by the directing his course aright, and not by the fortune of the voyage. But the physician, and perhaps the politician, hath no particular acts demonstrative of his ability, but is judged most by the event ; which is ever but as it is taken : for who can tell, if a patient die or recover, or if a state be preserved or ruined, whether it be art or accident ? And therefore many times the impostor is prized, and the man of virtue taxed. Nay, we see the weakness and credulity of men is such, as they will often prefer a mountebank or witch before a learned physician. And therefore the poets were clear-sighted in discerning this extreme folly, when they made Æsculapius and Circe brother and sister, both children of the sun, as in the verses ; *Æn. vii. 772.*

Ipse repertorem medicinæ talis et artis
Fulmine Phœbigenam Stygias detrusit ad undas :

And again,

Dives inaccessos ubi Solis filia lucos, etc. *Æn. vii. 11.*

For in all times, in the opinion of the multitude, witches, and old women, and impostors, have had a competition with physicians. And what followeth ? Even this ; that physicians say to themselves, as Solomon expresseth it upon an higher occasion ; “*If it befall to me, as befallieth to the fools, why should I labour to be more wise ?*” And therefore I cannot much blame physicians, that they use commonly to intend some other art or practice, which they fancy more than their profession. For you shall have of them, antiquaries, poets, humanists, statesmen, merchants, divines, and in every of these better seen than in their profession ; and no doubt, upon this ground, that they find that mediocrity and excellency in their art maketh no difference in profit or reputation towards their fortune ; for the weakness of patients, and sweetness of life, and nature of hope, maketh men depend on physicians with all their defects. But, nevertheless, these

things, which we have spoken of, are courses begotten between a little occasion, and a great deal of sloth and default ; for if we will excite and awake our observation, we shall see, in familiar instances, what a predominant faculty the subtilty of spirit hath over the variety of matter or form ; nothing more variable than faces and countenances, yet men can bear in memory the infinite distinctions of them ; nay, a painter with a few shells of colours, and the benefit of his eye, and habit of his imagination, can imitate them all that ever have been, are, or may be, if they were brought before him. Nothing more variable than voices, yet men can likewise discern them personally ; nay, you shall have a buffoon, or *pantomimus*, will express as many as he pleaseth. Nothing more variable than the differing sounds of words, yet men have found the way to reduce them to a few simple letters. So that it is not the insufficiency or incapacity of man's mind, but it is the remote standing or placing thereof, that breedeth these mazes and incomprehensions : for as the sense afar off is full of mistaking, but is exact at hand, so it is of understanding ; the remedy whereof is not to quicken or strengthen the organ, but to go nearer to the object ; and therefore there is no doubt, but if the physicians will learn and use the true approaches and avenues of nature, they may assume as much as the poet saith :

Et quoniam variant morbi, varibimus artes :
Mille mali species, mille salutis erunt.

Which that they should do, the nobleness of their art doth deserve, well shadowed by the poets, in that they made *Æsculapius* to be the son of the Sun, the one being the fountain of life, the other as the second stream ; but infinitely more honoured by the example of our Saviour, who made the body of man the object of his miracles, as the soul was the object of his doctrine. For we read not that ever he vouchsafed to do any miracle about honour or money, except that one for giving tribute to *Cæsar*, but only about the preserving, sustaining, and healing the body of man.

Medicine is a science which hath been, as we have said, more professed than laboured, and yet more laboured than advanced ; the labour having been, in my judgment, rather in circle than in progression. For I find much iteration, but small addition. It considereth the causes of diseases, with the occasions or impulsions ; the diseases themselves, with the accidents ; and the cures, with the preservations. The deficiencies which I think good to note, being a few of many, and those such as are of a more open and manifest nature, I will enumerate and not place.

The first is the discontinuance of the ancient and serious diligence of *Hippocrates*, which used to set down a narrative of the special cases of his patients, and how they proceeded, and how they were judged by recovery or death. Therefore having an example proper in the father of the art, I shall not need to allege an example foreign, of the wisdom of the lawyers, who are careful to report new cases and decisions for the direction of future judgments. This continuance of Medicinal

History I find deficient, which I understand neither to be so infinite as to extend to every common case, nor so reserved, as to admit none but wonders ; for many things are new in the manner, which are not new in the kind ; and if men will intend to observe, they shall find much worthy to observe.

In the inquiry which is made by anatomy, I find much deficiency : for they inquire of the parts, and their substances, figures, and collocations ; but they inquire not of the diversities of the parts, the secrecies of the passages, and the seats or nestlings of the humours, nor much of the footsteps and impressions of diseases ; the reason of which omission I suppose to be, because the first inquiry may be satisfied in the view of one or a few anatomies ; but the latter, being comparative and casual, must arise from the view of many. And as to the diversity of parts, there is no doubt but the facture or framing of the inward parts is as full of difference as the outward, and in that is the cause continent of many diseases, which not being observed, they quarrel many times with the humours, which are not in fault, the fault being in the very frame and mechanic of the part, which cannot be removed by medicine alterative, but must be accommodated and palliated by diets and medicines familiar. And for the passages and pores, it is true, which was anciently noted, that the more subtile of them appear not in anatomies, because they are shut and latent in dead bodies, though they be open and manifest in life : which being supposed, though the inhumanity of *anatomia vivorum* was by Celsus justly approved ; yet in regard of the great use of this observation, the inquiry needed not by him so slightly to have been relinquished altogether, or referred to the casual practices of surgery, but might have been well diverted upon dissection of beasts alive, which, notwithstanding the dissimilitude of their parts, may sufficiently satisfy this inquiry. And for the humours, they are commonly passed over in anatomies as purgaments, whereas it is most necessary to observe, what cavities, nests, and receptacles the humours do find in the parts, with the differing kind of the humour so lodged and received. And as for the footsteps of diseases, and their devastations of the inward parts, impostumations, exulcerations, discontinuations, putrefactions, consumptions, contractions, extensions, convulsions, dislocations, obstructions, repletions, together with all preternatural substances, as stones, carnosities, excrescences, worms, and the like ; they ought to have been exactly observed by multitude of anatomies, and the contribution of men's several experiences, and carefully set down, both historically, according to the appearances, and artificially, with a reference to the diseases and symptoms which resulted from them, in case where the anatomy is of a defunct patient : whereas now, upon opening of bodies, they are passed over slightly and in silence.

In the inquiry of diseases they do abandon the cures of many, some as in their nature incurable, and others as past the period of cure ; so that Sylla and the triumvirs never proscribed so many men to die, as they do by their ignorant edicts, whereof numbers do escape with less difficulty, then they did in the Roman proscriptions. Therefore I will

not doubt to note as a deficiency, that they inquire not the perfect cures of many diseases, or extremities of diseases, but pronouncing them incurable, do enact a law of neglect, and exempt ignorance from discredit.

Nay farther, I esteem it the office of a physician not only to restore health, but to mitigate pain and dolours, and not only when such mitigation may conduce to recovery, but when it may serve to make a fair and easy passage : for it is no small felicity which Augustus Cæsar was wont to wish to himself, that same *euthanasia*, and which was specially noted in the death of Antoninus Pius, whose death was after the fashion and semblance of a kindly and pleasant sleep. So it is written of Epicurus, that after his disease was judged desperate, he drowned his stomach and senses with a large draught and ingurgitation of wine ; whereupon the epigram was made, "*Hinc Stygius ebrius hausit aquas :*" he was not sober enough to taste any bitterness of the Stygian water. But the physicians, contrariwise, do make a kind of scruple and religion to stay with the patient after the disease is deplored ; whereas, in my judgment, they ought both to inquire the skill, and to give the attendances for the facilitating and asswaging of the pain and agonies of death.

In the consideration of the cures of diseases, I find a deficiency in the receipts of propriety, respecting the particular cures of diseases : for the physicians have frustrated the fruit of tradition and experience by their magistralities, in adding, and taking out, and changing *quid pro quo*, in their receipts, at their pleasures, commanding so over the medicine, as the medicine cannot command over the disease ; for except it be treacle, and Mithridatum, and of late diascordium, and a few more, they tie themselves to no receipts severely and religiously : for as to the confections of sale which are in the shops, they are for readiness, and not for propriety ; for they are upon general intentions of purging, opening, comforting, altering, and not much appropriated to particular diseases ; and this is the cause why empirics and old women are more happy many times in their cures than learned physicians, because they are more religious in holding their medicines. Therefore here is the deficiency which I find, that physicians have not, partly out of their own practice, partly out of the constant probations reported in books, and partly out of the traditions of empirics, set down and delivered over certain experimental medicines for the cure of particular diseases, besides their own conjectural and magistral descriptions. For as they were the men of the best composition in the state of Rome, which either being consuls inclined to the people, or being tribunes inclined to the senate ; so in the matter we now handle, they be the best physicians, which being learned, incline to the traditions of experience, or being empirics, incline to the methods of learning.

In preparation of medicines, I do find strange, especially, considering how mineral medicines have been extolled, and that they are safer for the outward than inward parts, that no man hath sought to make an imitation by art of natural baths, and medicinable fountains,

which nevertheless are confessed to receive their virtues from minerals ; and not so only, but discerned and distinguished from what particular mineral they receive tincture, as sulphur, vitriol, steel, or the like ; which nature, if it may be reduced to compositions of art, both the variety of them will be increased, and the temper of them will be more commanded.

But lest I grow to be more particular than is agreeable, either to my intention or to proportion ; I will conclude this part with the note of one deficiency more, which seemeth to me of greatest consequence ; which is, that the prescripts in use are too compendious to attain their end ; for to my understanding, it is a vain and flattering opinion to think any medicine can be so sovereign, or so happy, as that the receipt or use of it can work any great effect upon the body of man : it were a strange speech, which spoken, or spoken oft, should reclaim a man from a vice to which he were by nature subject ; it is order, pursuit, sequence, and interchange of application, which is mighty in nature : which although it require more exact knowledge in prescribing, and more precise obedience in observing, yet is recompensed with the magnitude of effects. And although a man would think by the daily visitations of the physicians, that there were a pursuance in the cure ; yet let a man look into their prescripts and ministrations, and he shall find them but inconstancies, and every day's devices, without any settled providence or project ; not that every scrupulous or superstitious prescript is effectual, no more than every strait way is the way to heaven, but the truth of the direction must precede severity of observance.

For Cosmetic, it hath parts civil, and parts effeminate : for cleanliness of body was ever esteemed to proceed from a due reverence to God, to society, and to ourselves. As for artificial decoration, it is well worthy of the deficiencies which it hath ; being neither fine enough to deceive, nor handsome to use, nor wholesome to please.

For Athletic, I take the subject of it largely, that is to say, for any point of ability, whereunto the body of man may be brought, whether it be of activity, or of patience ; whereof activity hath two parts strength and swiftness : and patience likewise hath two parts, hardness against wants and extremities, and indurance of pain and torment, whereof we see the practices in tumblers, in savages, and in those that suffer punishment : nay, if there be any other faculty which falls not within any of the former divisions, as in those that dive, that obtain a strange power of containing respiration, and the like, I refer it to this part. Of these things the practices are known, but the philosophy that concerneth them is not much inquired ; the rather, I think, because they are supposed to be obtained, either by an aptness of nature, which cannot be taught, or only by continual custom, which is soon prescribed ; which though it be not true, yet I forbear to note any deficiencies, for the Olympian games are down long since, and the mediocrity of these things is for use ; as for the excellency of them, it serveth for the most part but for mercenary ostentation.

For arts of Pleasure sensual, the chief deficiency in them is of laws

to repress them. For as it hath been well observed, that the arts which flourish in times while virtue is in growth, are military, and while virtue is in state, are liberal, and while virtue is in declination, are voluptuary ; so I doubt, that this age of the world is somewhat upon the descent of the wheel. With arts voluptuary I couple practices jocular ; for the deceiving of the senses is one of the pleasures of the senses. As for games of recreation, I hold them to belong to civil life and education. And thus much of that particular human philosophy which concerns the body, which is but the tabernacle of the mind.

FOR Human Knowledge, which concerns the Mind, it hath two parts, the one that inquireth of the substance or nature of the soul or mind ; the other that inquireth of the faculties or functions thereof.

Unto the first of these, the considerations of the original of the soul, whether it be native or adventive, and how far it is exempted from laws of matter, and of the immortality thereof, and many other points, do appertain ; which have been not more laboriously inquired than variously reported ; so as the travel therein taken, seemeth to have been rather in a maze than in a way. But although I am of opinion, that this knowledge may be more really and soundly inquired even in nature than it hath been ; yet I hold, that in the end it must be bounded by religion, or else it will be subject to deceit and delusion : for as the substance of the soul in the creation was not extracted out of the mass of heaven and earth, by the benediction of a *procreat*, but was immediately inspired from God ; so it is not possible that it should be, otherwise than by accident, subject to the laws of heaven and earth, which are the subject of philosophy ; and therefore the true knowledge of the nature, and state of the soul, must come by the same inspiration that gave the substance. Unto this part of knowledge touching the soul there be two appendixes, which, as they have been handled, have rather vapoured forth fables than kindled truth, divination, and fascination.

Divination hath been anciently and fitly divided into artificial, and natural ; whereof artificial is, when the mind maketh a prediction by argument, concluding upon signs and tokens : natural is, when the mind hath a presentation by an internal power, without the inducement of a sign. Artificial is of two sorts, either when the argument is coupled with a derivation of causes, which is rational ; or when it is only grounded upon a coincidence of the effect, which is experimental ; whereof the latter for the most part is superstitious : such as were the heathen observations upon the inspection of sacrifices, the flights of birds, the swarming of bees, and such as was the Chaldean astrology, and the like. For artificial divination, the several kinds thereof are distributed amongst particular knowledges. The astronomer hath his predictions, as of conjunctions, aspects, eclipses, and the like. The physician hath his predictions, of death, of recovery, of the accidents and issues of diseases. The politician hath his predictions ; “*O urbem venalem, et cito perituram, si emptorem invenerit !*” which

stayed not long to be performed in Sylla first, and after in Cæsar ; so as these predictions are now impertinent, and to be referred over. But the divination which springeth from the internal nature of the soul, is that which we now speak of, which hath been made to be of two sorts, primitive, and by influxion. Primitive is grounded upon the supposition, that the mind, when it is withdrawn and collected into itself, and not diffused into the organs of the body, hath some extent and latitude of prenotion, which therefore appeareth most in sleep, in extasies, and near death, and more rarely in waking apprehensions ; and is induced and furthered by those abstinences and observances which make the mind most to consist in itself. By influxion, is grounded upon the conceit that the mind, as a mirror or glass, should take illumination from the foreknowledge of God and spirits : unto which the same regiment doth likewise conduce. For the retiring of the mind within itself, is the state which is most susceptible of divine influxions, save that it is accompanied in this case with a fervency and elevation, which the ancients noted by fury, and not with a repose and quiet, as it is in the other.

Fascination is the power and act of imagination more intensive upon other bodies than the body of the imaginant : for of that we speak in the proper place ; wherein the school of Paracelsus, and the disciples of pretended natural magic, have been so intemperate, as they have exalted the power of the imagination to be much one with the power of miracle-working faith : others, that draw nearer to probability, calling to their view the secret passages of things, and especially of the contagion that passeth from body to body, do conceive it should likewise be agreeable to nature, that there should be some transmissions and operations from spirit to spirit without the mediation of the senses : whence the conceits have grown, now almost made civil, of the mastering spirit, and the force of confidence, and the like. Incident unto this is the inquiry how to raise and fortify the imagination ; for if the imagination fortified have power, then it is material to know how to fortify and exalt it. And herein comes in crookedly and dangerously, a palliation of a great part of ceremonial magic. For it may be pretended, that ceremonies, characters, and charms, do work, not by any tacit or sacramental contract with evil spirits, but serve only to strengthen the imagination of him that useth it ; as images are said by the Roman church to fix the cogitations, and raise the devotions of them that pray before them. But for mine own judgment, if it be admitted that imagination hath power, and that ceremonies fortify imagination, and that they be used sincerely and intentionally for that purpose ; yet I should hold them unlawful, as opposing to that first edict which God gave unto man, "*In sudore vultus comedes panem tuum.*" For they propound those noble effects, which God hath set forth unto man to be bought at the price of labour, to be attained by a few easy and slothful observances. Deficiencies in these knowledges I will report none, other than the general deficiency, that it is not known how much of them is verity, and how much vanity.

The knowledge which respecteth the faculties of the mind of man, is of two kinds ; the one respecting his understanding and reason, and the other his will, appetite, and affection ; whereof the former produceth direction or decree, the latter action or execution. It is true that the imagination is an agent or *nuncius* in both provinces, both the judicial and the ministerial. For sense sendeth over to imagination before reason have judged, and reason sendeth over to imagination before the decree can be acted : for imagination ever precedeth voluntary motion, saving that this Janus of imagination hath differing faces ; for the face towards reason hath the print of truth, but the face towards action hath the print of good, which nevertheless are faces,

Quales decet esse sororum :

Neither is the imagination simply and only a messenger, but is invested with, or at leastwise usurpeth no small authority in itself, besides the duty of the message. For it was well said by Aristotle, "That the mind hath over the body that commandment, which the lord hath over a bondman ; but that reason hath over the imagination that commandment, which a magistrate hath over a free citizen," who may come also to rule in his turn. For we see that, in matters of faith and religion, we raise our imagination above our reason, which is the cause why religion sought ever access to the mind by similitudes, types, parables, visions, dreams. And again, in all persuasions, that are wrought by eloquence, and other impressions of like nature, which do paint and disguise the true appearance of things, the chief recommendation unto reason is from the imagination. Nevertheless, because I find not any science that doth properly or fitly pertain to the imagination, I see no cause to alter the former division. For as for poesy, it is rather pleasure, or play of imagination, than a work or duty thereof. And if it be a work, we speak not now of such parts of learning as the imagination produceth, but of such sciences as handle and consider of the imagination ; no more than we shall speak now of such knowledges as reason produceth, for that extendeth to all philosophy, but of such knowledges as do handle and inquire of the faculty of reason ; so as poesy had its true place. As for the power of the imagination in nature, and the manner of fortifying the same, we have mentioned it in the doctrine "*De anima*," whereunto most fitly it belongeth : and lastly for imaginative or insinuating reason, which is the subject of rhetoric, we think it best to refer it to the arts of reason. So therefore we content ourselves with the former division, that Human Philosophy, which respecteth the faculties of the mind of man, hath two parts, Rational and Moral.

The part of Human Philosophy which is rational, is of all knowledges, to the most wits, the least delightful, and seemeth but a net of subtilty and spinosity : for as it was truly said, that knowledge is "*pabulum animi* ;" so in the nature of men's appetite to this food, most men are of the taste and stomach of the Israelites in the desert, that would fain have returned "*ad ollas carniū*," and were weary of

manna ; which though it were celestial, yet seemed less nutritive and comfortable. So generally men taste well knowledges that are drenched in flesh and blood, civil history, morality, policy, about the which men's affections, praises, fortunes, do turn and are conversant ; but this same "lumen siccum" doth parch and offend most men's watery and soft natures. But to speak truly of things as they are in worth, "rational knowledges" are the keys of all other arts ; for as Aristotle saith aptly and elegantly, "that the hand is the instrument of instruments, and the mind is the form of forms ;" so these be truly said to be the art of arts ; neither do they only direct, but likewise confirm and strengthen : even as the habit of shooting doth not only enable to shoot a nearer shoot, but also to draw a stronger bow.

The arts intellectual are four in number, divided according to the ends whereunto they are referred ; for man's labour is to invent that which is sought or propounded ; or to judge that which is invented ; or to retain that which is judged ; or to deliver over that which is retained. So as the arts must be four ; art of inquiry or invention ; art of examination or judgment ; art of custody or memory ; and art of elocution or tradition.

Invention is of two kinds, much differing ; the one of arts and sciences, and the other of speech and arguments. The former of these I do report deficient ; which seemeth to me to be such a deficiency, as if in the making of an inventory, touching the state of a defunct, it should be set down, that there is no ready money. For as money will fetch all other commodities, so this knowledge is that which should purchase all the rest. And like as the West Indies had never been discovered, if the use of the mariner's needle had not been first discovered, though the one be vast regions, and the other a small motion ; so it cannot be found strange, if sciences be no farther discovered, if the art itself of invention and discovery hath been passed over.

That this part of knowledge is wanting, to my judgment, standeth plainly confessed : for first, logic doth not pretend to invent sciences, or the axioms of sciences, but passeth it over with a *cuique in sua arte credendum*. And Celsus acknowledgeth it gravely, speaking of the empirical and dogmatical sects of physicians, "That medicines and cures were first found out, and then after the reasons and causes were discoursed ; and not the causes first found out, and by light from them the medicines and cures discovered." And Plato, in his *Theætetus*, noteth well, "That particulars are infinite, and the higher generalities give no sufficient direction ; and that the pith of all sciences, which maketh the artsman differ from the inexpert, is in the middle propositions, which in every particular knowledge are taken from tradition and experience." And therefore we see, that they which discourse of the inventions and originals of things, refer them rather to chance than to art, and rather to beasts, birds, fishes, serpents, than to men,

Dictamnum genetrix Cretæa carpit ab Ida,
 Puberibus caulem foliis, et flore comantem
 Purpureo : non illa feris incognita capris,
 amina cum tergo volucres hæserè sagittæ.

So that it was no marvel, the manner of antiquity being to consecrate inventors, that the Ægyptians had so few human idols in their temples, but almost all brute ;

Omnigenumque Deum monstra, et latrator Anubis,
Contra Neptunum, et Venerem, contraque Minervam, etc.

And if you like better the tradition of the Grecians, and ascribe the first inventions to men, yet you will rather believe that Prometheus first struck the flints, and marvelled at the spark, than that when he first struck the flints he expected the spark ; and therefore we see the West Indian Prometheus had no intelligence with the European, because of the rareness with them of flint, that gave the first occasion : so as it should seem, that hitherto men are rather beholden to a wild goat for surgery, or to a nightingale for music, or to the ibis for some part of physic, or to the potlid that fled open for artillery, or generally to chance, or anything else, than to logic, for the invention of arts and sciences. Neither is the form of invention which Virgil describeth much other.

Ut varias usus meditando extunderet artes
Paulatim.

For if you observe the words well, it is no other method than that which brute beasts are capable of and do put in use : which is a perpetual intending or practising some one thing, urged and imposed by an absolute necessity of conservation of being ; for so Cicero saith very truly, “*Usus uni rei deditus, et naturam et artem sæpe vincit,*” And therefore if it be said of men,

Labor omnia vincit
Improbis, et duris urgens in rebus egestas ;

it is likewise said of beasts, “*Quis psittaco docuit suum χαῖρε ;*” Who taught the raven in a drought to throw pebbles into an hollow tree, where she espied water, that the water might rise so as she might come to it ? Who taught the bee to sail through such a vast sea of air, and to find the way from a field in flower, a great way off, to her hive ? Who taught the ant to bite every grain of corn that she burieth in her hill, lest it should take root and grow ? Add then the word *extundere*, which importeth the extreme difficulty ; and the word *paulatim*, which importeth the extreme slowness ; and we are where we were, even amongst the Ægyptian gods ; there being little left to the faculty of reason, and nothing to the duty of art, for matter of invention.

Secondly, the induction which the logicians speak of, and which seemeth familiar with Plato, whereby the principles of sciences may be pretended to be invented, and so the middle propositions by derivation from the principles ; their form of induction, I say, is utterly vicious and incompetent ; wherein their errand is the fouler, because it is the duty of art to perfect and exalt nature ; but they contrariwise have wronged, abused, and traduced nature. For he that shall atten-

tively observe how the mind doth gather this excellent dew of knowledge, like unto that which the poet speaketh of, "*Aërei mellis cœlestia dona*," distilling and contriving it out of particulars natural and artificial, as the flowers of the field and garden, shall find, that the mind of herself by nature doth manage and act an induction much better than they describe it. For to conclude upon an enumeration of particulars without instance contradictory, is no conclusion, but a conjecture; for who can assure, in many subjects, upon those particulars which appear of a side, that there are not other on the contrary side which appear not. As if Samuel should have rested upon those sons of Jesse, which were brought before him, and failed of David which was in the field. And this form, to say truth, is so gross, as it had not been possible for wits so subtile, as have managed these things, to have offered it to the world, but that they hasted to their theories and dogmaticals, and were imperious and scornful toward particulars, which their manner was to use but as *lictors* and *viatores*, for serjeants and whiflers, *ad summovendam turbam*, to make way and make room for their opinions, rather than in their true use and service: certainly it is a thing may touch a man with a religious wonder to see how the footsteps of seducement are the very same in divine and human truth; for as in divine truth man cannot endure to become as a child; so in human, they reputed the attending the inductions, whereof we speak, as if it were a second infancy or childhood.

Thirdly, allow some principles or axioms were rightly induced, yet nevertheless certain it is that middle propositions cannot be deduced from them in subject of nature by syllogism, that is, by touch and reduction of them to principles in a middle term. It is true that in sciences popular, as moralities, laws, and the like, yea and divinity, because it pleaseth God to apply himself to the capacity of the simplest, that form may have use, and in natural philosophy likewise, by way of argument or satisfactory reason, "*Quæ assensum parit, operis effecta est*;" but the subtilty of nature and operations will not be enchained in those bonds; for arguments consist of propositions, and propositions of words, and words are but the current tokens or marks of popular notions of things; which notions, if they be grossly and variably collected out of particulars, it is not the laborious examination either of consequences of arguments, or of the truth of propositions, that can ever correct that error, being, as the physicians speak, in the first digestion; and therefore it was not without cause, that so many excellent philosophers became sceptics and academics, and denied any certainty of knowledge or comprehension, and held opinion, that the knowledge of man extended only to appearances and probabilities. It is true that in Socrates it was supposed to be but a form of irony, "*Scientiam dissimulando simulavit*:" for he used to disable his knowledge, to the end to enhance his knowledge, like the humour of Tiberius in his beginnings, that would reign, but would not acknowledge so much; and in the later academy, which Cicero embraced, this opinion also of *acatalepsia*, I doubt, was not held

sincerely : for that all those which excelled in copy of speech, seem to have chosen that sect as that which was fittest to give glory to their eloquence, and variable discourses ; being rather like progresses of pleasure, than journeys to an end. But assuredly many scattered in both academics did hold it in subtilty and integrity. But here was their chief error ; they charged the deceit upon the senses, which in my judgment, notwithstanding all their cavillations, are very sufficient to certify and report truth, though not always immediately, yet by comparison, by help of instrument, and by producing and urging such things as are too subtile for the sense, to some effect comprehensible by the sense, and other like assistance. But they ought to have charged the deceit upon the weakness of the intellectual powers, and upon the manner of collecting and concluding upon the reports of the senses. This I speak not to disable the mind of man, but to stir it up to seek help : for no man, be he never so cunning or practised, can make a straight line or perfect circle by steadiness of hand, which may be easily done by help of a ruler or compass.

This part of invention, concerning the invention of sciences, I purpose, if God give me leave, hereafter to propound, having digested it into two parts ; whereof the one I term *experientia literata*, and the other *interpretatio naturæ* : the former being but a degree and rudiment of the latter. But I will not dwell too long, nor speak too great upon a promise.

The invention of speech or argument is not properly an invention : for to invent, is to discover that we know not, and not to recover or resummon that which we already know, and the use of this invention is no other, but out of the knowledge, whereof our mind is already possessed, to draw forth or call before us that which may be pertinent to the purpose which we take into our consideration. So as, to speak truly, it is no invention, but a remembrance or suggestion, with an application ; which is the cause why the schools do place it after judgment, as subsequent and not precedent. Nevertheless, because we do account it a chace, as well of deer in an enclosed park, as in a forest at large, and that it hath already obtained the name ; let it be called invention, so as it be perceived and discerned that the scope and end of this invention is readiness and present use of our knowledge, and not addition or amplification thereof.

To procure this ready use of knowledge there are two courses, preparation and suggestion. The former of these seemeth scarcely apart of knowledge, consisting rather of diligence than of any artificial erudition. And herein Aristotle wittily, but hurtfully, doth deride the sophists near his time, saying, "They did as if one that professed the art of shoemaking should not teach how to make up a shoe, but only exhibit in a readiness a number of shoes of all fashions and sizes." But yet a man might reply, that if a shoemaker should have no shoes in his shop, but only work as he is bespoken, he should be weakly customed. But our Saviour, speaking of divine knowledge, saith, "that the kingdom of heaven is like a good householder, that bringeth forth both new and old store : " and we see the ancient writers of rhetoric do give it in pre-

cept that pleaders should have the places whereof they have most continual use, ready handled in all the variety that may be ; as that, to speak for the literal interpretation of the law against equity, and contrary ; and to speak for presumptions and inferences against testimony, and contrary. And Cicero himself, being broken unto it by great experience, delivereth it plainly ; that whatsoever a man shall have occasion to speak of, if he will take the pains, may have it in effect premeditate, and handled *in thesi* : so that when he cometh to a particular, he shall have nothing to do, but to put to names, and times, and places, and such other circumstances of individuals. We see likewise the exact diligence of Demosthenes, who in regard of the great force that the entrance and access into causes hath to make a good impression, had ready framed a number of prefaces for orations and speeches. All which authorities and precedents may overweigh Aristotle's opinion, that would have us change a rich wardrobe for a pair of shears.

But the nature of the collection of this provision or preparatory store, though it be common both to logic and rhetoric, yet having made an entry of it here, where it came first to be spoken of, I think fit to refer over the farther handling of it to rhetoric.

The other part of invention, which I term suggestion, doth assign and direct us to certain marks or places, which may excite our mind to return and produce such knowledge, as it hath formerly collected, to the end we may make use thereof. Neither is this use, truly taken, only to furnish argument to dispute probably with others, but likewise to minister unto our judgment to conclude aright within ourselves. Neither may these places serve only to prompt our invention, but also to direct our inquiry. For a faculty of wise interrogating is half a knowledge. For as Plato saith, "Whosoever seeketh, knoweth that which he seeketh for in a general notion, else how shall he know it when he hath found it?" And therefore the larger your anticipation is, the more direct and compendious is your search. But the same places which will help us what to produce of that which we know already, will also help us, if a man of experience were before us, what questions to ask : or, if we have books and authors to instruct us, what points to search and revolve : so as I cannot report, that this part of invention, which is that which the schools call topics, is deficient.

Nevertheless topics are of two sorts, general and special. The general we have spoken to, but the particular hath been touched by some, but rejected generally as inartificial and variable. But leaving the humour which hath reigned too much in the schools, which is, to be vainly subtile in a few things, which are within their command, and to reject the rest, I do receive particular topics, that is, places or directions of invention and inquiry in every particular knowledge, as things of great use, being mixtures of logic with the matter of sciences : for in these it holdeth, "*Ars inveniendi adolescit cum inventis* ;" for as in going of a way, we do not only gain that part of the way which is passed, but we gain the better sight of that part of the way which remaineth ; so every degree of proceeding in a science giveth a light to that which followeth, which light if we strengthen, by drawing it forth

into questions or places of inquiry, we do greatly advance our pursuit.

Now we pass unto the arts of judgment, which handle the natures of proofs and demonstrations, which as to induction hath a coincidence with invention: for in all inductions, whether in good or vicious form, the same action of the mind which inventeth, judgeth; all one as in the sense: but otherwise it is in proof by syllogism; for the proof being not immediate, but by mean, the invention of the mean is one thing, and the judgment of the consequence is another; the one exciting only, the other examining. Therefore, for the real and exact form of judgment, we refer ourselves to that which we have spoken of interpretation of nature.

For the other judgment by syllogism, as it is a thing most agreeable to the mind of man, so it hath been vehemently and excellently laboured: for the nature of man doth extremely covet to have somewhat in his understanding fixed and unmoveable, and as a rest and support of the mind. And therefore as Aristotle endeavoureth to prove, that in all motion there is some point quiescent; and as he elegantly expoundeth the ancient fable of Atlas, that stood fixed, and bare up the heaven from falling, to be meant of the poles or axle-tree of heaven, whereupon the conversion is accomplished; so assuredly men have a desire to have an Atlas or axle-tree within, to keep them from fluctuation, which is like to a perpetual peril of falling; therefore men did hasten to set down some principles about which the variety of their disputations might turn.

So then this art of judgment is but the reduction of propositions to principles in a middle term. The principles to be agreed by all, and exempted from argument: the middle term to be elected at the liberty of every man's invention: the reduction to be of two kinds, direct and inverted; the one when the proposition is reduced to the principle, which they term a probation ostensive; the other, when the contradictory of the proposition is reduced to the contradictory of the principle, which is that which they call *per incommodum*, or pressing an absurdity; the number of middle terms to be as the proposition standeth degrees more or less removed from the principle.

But this art hath two several methods of doctrine, the one by way of direction, the other by way of caution; the former frameth and setteth down a true form of consequence, by the variations and deflections from which errors and inconsequences may be exactly judged. Toward the composition and structure of which form it is incident to handle the parts thereof, which are propositions, and the parts of propositions, which are simple words; and this is that part of logic which is comprehended in the analytics.

The second method of doctrine was introduced for expedite use and assurance sake discovering the more subtile forms of sophisms and illaquations, with their redargutions, which is that which is termed *Elenches*. For although in the more gross sorts of fallacies it happeneth, as Seneca maketh the comparison well, as in juggling feats, which though we know not how they are done, yet we know

well it is not as it seemeth to be, yet the more subtile sort of them doth not only put a man besides his answer, but doth many times abuse his judgment.

This part concerning Elenches is excellently handled by Aristotle in precept, but more excellently by Plato in example; not only in the persons of the sophists, but even in Socrates himself, who professing to affirm nothing, but to infirm that which was affirmed by another, hath exactly expressed all the forms of objection, fallacy, and redargution. And although we have said that the use of this doctrine is for redargution; yet it is manifest, the degenerate and corrupt use is for caption and contradiction, which passeth for a great faculty, and no doubt is of very great advantage, though the difference be good which was made between orators and sophisters, that the one is as the greyhound, which hath his advantage in the race, and the other as the hare, which hath her advantage in the turn, so as it is the advantage of the weaker creature.

But yet farther, this doctrine of Elenches hath a more ample latitude and extent, than is perceived; namely, unto divers parts of knowledge; whereof some are laboured, and others omitted. For first, I conceive, though it may seem at first somewhat strange, that that part which is variably referred, sometimes to logic, sometimes to metaphysic, touching the common adjuncts of essences, is but an Elenche; for the great sophism of all sophisms being equivocation or ambiguity of words and phrase, especially of such words as are most general and intervene in every inquiry; it seemeth to me that the true and fruitful uses, leaving vain subtilties and speculations, of the inquiry of majority, minority, priority, posteriority, identity, diversity, possibility, act, totality, parts, existence, privation, and the like, are but wise cautions against ambiguities of speech. So again, the distribution of things into certain tribes, which we call categories or predicaments, are but cautions against the confusion of definitions and divisions.

Secondly, there is a seducement that worketh by the strength of the impression, and not by the subtilty of the illaqueation, not so much perplexing the reason, as over-ruling it by power of the imagination. But this part I think more proper to handle, when I shall speak of rhetoric.

But lastly, there is yet a much more important and profound kind of fallacies in the mind of man, which I find not observed or inquired at all, and think good to place here, as that which of all others appertaineth most to rectify judgment: the force whereof is such, as it doth not dazzle or snare the understanding in some particulars, but doth more generally and inwardly infect and corrupt the state thereof. For the mind of man is far from the nature of a clear and equal glass, wherein the beams of things should reflect according to their true incidence; nay, it is rather like an enchanted glass, full of superstition and imposture, if it be not delivered and reduced. For this purpose, let us consider the false appearances that are imposed upon us by the general nature of the mind, beholding them in an example or two;

as first in that instance which is the root of all superstition, namely, that to the nature of the mind of all men it is consonant for the affirmative or active to effect, more than the negative or privative. So that a few times hitting, or presence, countervails oft-times failing, or absence ; as was well answered by Diagoras to him that showed him, in Neptune's temple, the great number of pictures of such as had escaped shipwreck, and had paid their vows to Neptune, saying, "Advise now, you that think it folly to invoke Neptune in tempest. Yea, but, saith Diagoras, where are they painted that are drowned?" Let us behold it in another instance, namely, "That the spirit of man, being of an equal and uniform substance, doth usually suppose and feign in nature a greater equality and uniformity than is in truth." Hence it cometh, that the mathematicians cannot satisfy themselves, except they reduce the motions of the celestial bodies to perfect circles, rejecting spiral lines, and labouring to be discharged of eccentrics. Hence it cometh, that whereas there are many things in nature, as it were, *monodica, sui juris*; yet the cogitations of man do feign unto them relatives, parallels, and conjugates, whereas no such thing is ; as they have feigned an element of fire to keep square with earth, water, and air, and the like ; nay, it is not credible, till it be opened, what a number of fictions and fantasies, the similitude of human actions and arts, together with the making of man *communis mensura*, have brought into natural philosophy, not much better than the heresy of the Anthropomorphites, bred in the cells of gross and solitary monks, and the opinion of Epicurus, answerable to the same in heathenism, who supposed the gods to be of human shape. And therefore Velleius the Epicurean needed not to have asked why God should have adorned the heavens with stars, as if he had been an *Ædis*; one that should have set forth some magnificent shows or plays. For if that great work-master had been of an human disposition, he would have cast the stars into some pleasant and beautiful works and orders, like the frets in the roofs of houses ; whereas one can scarce find a posture in square, or triangle, or straight line, amongst such an infinite number ; so differing an harmony there is between the spirit of man, and the spirit of nature.

Let us consider, again, the false appearances imposed upon us by every man's own individual nature and custom, in that feigned supposition that Plato maketh of the cave ; for certainly, if a child were continued in a grot or cave under the earth until maturity of age, and came suddenly abroad, he would have strange and absurd imaginations. So in like manner, although our persons live in the view of heaven, yet our spirits are included in the caves of our own complexions and customs, which minister unto us infinite errors and vain opinions, if they be not recalled to examination. But hereof we have given many examples in one of the errors, or peccant humours, which we ran briefly over in our first book.

And lastly, let us consider the false appearances that are imposed upon us by words, which are framed and applied according to the conceit and capacities of the vulgar sort ; and although we think we

govern our words, and prescribe it well, "Loquendum ut vulgus, sentiendum ut sapientes;" yet certain it is, that words, as a Tartar's bow, do shoot back upon the understanding of the wisest, and mightily intangle and pervert the judgement; so as it is almost necessary in all controversies and disputations, to imitate the wisdom of the mathematics, in setting down in the very beginning the definitions of our very words and terms, that others may know how we accept and understand them, and whether they concur with us or no. For it cometh to pass, for want of this, that we are sure to end there where we ought to have begun, which is in questions and differences about words. To conclude therefore, it must be confessed that it is not possible to divorce ourselves from these fallacies and false appearances, because they are inseparable from our nature and condition of life; so yet nevertheless the caution of them, (for all clenches, as was said, are but cautions), doth extremely import the true conduct of human judgment. The particular clenches or cautions against these three false appearances, I find altogether deficient.

There remaineth one part of judgment of great excellency, which to mine understanding is so slightly touched, as I may report that also deficient; which is, the application of the differing kinds of proofs to the differing kinds of subjects; for there being but four kinds of demonstrations, that is, by the immediate consent of the mind or sense, by induction, by syllogism, and by congruity; which is that which Aristotle calleth demonstration in orb, or circle, and not *a notioribus*; every of these hath certain subjects in the matter of sciences, in which respectively they have chieftest use; and certain others, from which respectively they ought to be excluded, and the rigour and curiosity in requiring the more severe proofs in some things, and chiefly the facility in contenting ourselves with the more remiss proofs in others, hath been amongst the greatest causes of detriment and hindrance to knowledge. The distributions and assignments of demonstrations, according to the analogy of sciences I note as deficient.

The custody or retaining of knowledge is either in writing or memory; whereof writing hath two parts, the nature of the character, and the order of the entry: for the art of characters, or other visible notes of words or things, it hath nearest conjugation with grammar; and therefore I refer it to the due place: for the disposition and collocation of that knowledge which we preserve in writing, it consisteth in a good digest of common-places wherein I am not ignorant of the prejudice imputed to the use of common-place books, as causing a retardation of reading, and some sloth or relaxation of memory. But because it is but a counterfeit thing in knowledges to be forward and pregnant, except a man be deep and full, I hold the entry of common-places to be a matter of great use and essence in studying, as that which assureth copy of invention, and contracteth judgment to a strength. But this is true, that of the methods of common-places that I have seen, there is none of any sufficient worth, all of them carrying merely the face of a school, and not of a world, and referring to vulgar matters, and pedantical divisions, without all life, or respect to action.

For the other principal part of the custody of knowledge, which is memory, I find that faculty in my judgment weakly inquired of. An art there is extant of it ; but it seemeth to me that there are better precepts than that art, and better practices of that art, than those received. It is certain the art, as it is, may be raised to points of ostentation prodigious : but in use, as it is now managed, it is barren, not burdensome, nor dangerous to natural memory, as is imagined, but barren ; that is, not dexterous to be applied to the serious use of business and occasions. And therefore I make no more estimation of repeating a great number of names or words upon once hearing, or the pouring forth of a number of verses or rhimes *ex tempore*, or the making of a satirical simile of every thing, or the turning of every thing to a jest, or the falsifying or contradicting of every thing by cavil, or the like, whereof in the faculties of the mind there is great *copia*, and such as by device and practice may be exalted to an extreme degree of wonder, than I do of the tricks of tumblers, funambuloes, baladines ; the one being the same in the mind, that the other is in the body ; matters of strangeness without worthiness.

This art of memory is but built upon two intentions ; the one prenotation, the other emblem. Prenotation dischargeth the indefinite seeking of that we would remember, and directeth us to seek in a narrow compass ; that is, somewhat that hath congruity with our place of memory. Emblem reduceth conceits intellectual to images sensible, which strike the memory more ; out of which axioms may be drawn much better practice than that in use : and besides which axioms, there are divers more touching help of memory, not inferior to them. But I did in the beginning distinguish, not to report those things deficient, which are but only ill managed.

There remaineth the fourth kind of rational knowledge, which is transitive, concerning the expressing or transferring our knowledge to others, which I will term by the general name of tradition or delivery. Tradition hath three parts : the first concerning the organ of tradition ; the second, concerning the method of tradition ; and the third, concerning the illustration of tradition.

For the organ of tradition, it is either speech or writing : for Aristotle saith well, " Words are the images of cogitations, and letters are the images of words ; " but yet it is not of necessity that cogitations be expressed by the medium of words. For whatsoever is capable of sufficient differences, and those perceptible by the sense, is in nature competent to express cogitations. And therefore we see in the commerce of barbarous people, that understand not one another's language, and in the practice of divers that are dumb and deaf, that men's minds are expressed in gestures, though not exactly, yet to serve the turn. And we understand farther, that it is the use of China, and the kingdoms of the high Levant, to write in characters real, which express neither letters nor words in gross, but things or notions ; insomuch as countries and provinces, which understand not one another's language, can nevertheless read one another's writings, because the characters are accepted more generally than the languages do extend ; and there-

fore they have a vast multitude of characters, as many, I suppose, as radical words.

These notes of cogitations are of two sorts ; the one when the note hath some similitude or congruity with the notion ; the other *ad placitum*, having force only by contract or acceptation. Of the former sort are hieroglyphics and gestures. For as to hieroglyphics, things of ancient use, and embraced chiefly by the Egyptians, one of the most ancient nations, they are but as continued impresses and emblems. And as for gestures, they are as transitory hieroglyphics, and are to hieroglyphics as words spoken are to words written, in that they abide not ; but they have evermore, as well as the other, an affinity with the things signified ; as Periander, being consulted with, how to preserve a tyranny newly usurped, bid the messenger attend and report what he saw him do, and went into his garden and topped all the highest flowers ; signifying, that it consisted in the cutting off and keeping low of the nobility and grandees. *Ad placitum* are the characters real before mentioned, and words : although some have been willing by curious inquiry, or rather by apt feigning, to have derived imposition of names from reason and intendment ; a speculation elegant, and, by reason it searcheth into antiquity, reverent ; but sparingly mixed with truth, and of small fruit. This portion of knowledge, touching the notes of things, and cogitations in general, I find not inquired, but deficient. And although it may seem of no great use, considering that words and writings by letter do far excel all the other ways ; yet because this part concerneth, as it were, the mint of knowledge, for words are the tokens current and accepted for conceits, as moneys are for values, and that it is fit men be not ignorant that moneys may be of another kind than gold and silver, I thought to propound it to better inquiry.

Concerning speech and words, the consideration of them hath produced the science of Grammar ; for man still striveth to reintegrate himself in those benedictions, from which by his fault he hath been deprived ; and as he hath striven against the first general curse, by the invention of all other arts ; so hath he sought to come forth of the second general curse, which was the confusion of tongues, by the art of grammar, whereof the use in a mother tongue is small ; in a foreign tongue more ; but most in such foreign tongues as have ceased to be vulgar tongues, and are turned only to learned tongues. The duty of it is of two natures ; the one popular, which is for the speedy and perfect attaining languages, as well for intercourse of speech, as for understanding of authors ; the other philosophical, examining the power and nature of words, as they are the footsteps and prints of reason : which kinds of analogy between words and reason is handled *sparsim*, brokenly, though not entirely ; and therefore I cannot report it deficient, though I think it very worthy to be reduced into a science by itself.

Unto grammar also belongeth, as an appendix, the consideration of the accidents of words, which are measure, sound, and elevation or accent, and the sweetness and harshness of them ; whence hath issued

some curious observations in rhetoric, but chiefly poesy, as we consider it, in respect of the verse, and not of the argument; wherein though men in learned tongues do tie themselves to the ancient measures, yet in modern languages it seemeth to me, as free to make new measures of verses as of dances; for a dance is a measured pace, as a verse is a measured speech. In these things the sense is better judge than the art;

Cœnæ fercula nostræ,
Mallem convivis, quam placuisse cociis.

And of the servile expressing antiquity in an unlike and unfit subject, it is well said, "*Quod tempore antiquum videtur, id incongruitate est maxime novum.*"

For ciphers, they are commonly in letters or alphabets, but may be in words. The kinds of ciphers, besides the simple ciphers, with changes, and intermixtures of nulls and non-significants, are many, according to the nature or rule of the infolding: wheel-ciphers, key-ciphers, doubles, *etc.* But the virtues of them, whereby they are to be preferred, are three; that they be not laborious to write and read; that they be impossible to decipher; and in some cases, that they be without suspicion. The highest degree whereof is to write *omnia per omnia*; which is undoubtedly possible with a proportion quincuple at most, of the writing infolding to the writing infolded, and no other restraint whatsoever. This art of ciphering hath for relative an art of deciphering, by supposition unprofitable, but, as things are, of great use. For suppose that ciphers were well managed, there be multitudes of them which exclude the decipherer. But in regard of the rawness and unskilfulness of the hands through which they pass, the greatest matters are many times carried in the weakest ciphers.

In the enumeration of these private and retired arts, it may be thought I seek to make a great muster-roll of sciences, naming them for show and ostentation, and to little other purpose. But let those which are skilful in them judge, whether I bring them in only for appearance, or whether in that which I speak of them, though in few words, there be not some seed of proficience. And this must be remembered, that as there be many of great account in their countries and provinces, which when they come up to the seat of the estate, are but of mean rank, and scarcely regarded; so these arts being here placed with the principal and supreme sciences, seem petty things; yet to such as have chosen them to spend their labours and studies in them, they seem great matters.

For the method of tradition, I see it hath moved a controversy in our time. But as in civil business, if there be a meeting, and men fall at words, there is commonly an end of the matter for that time, and no proceeding at all: so in learning, where there is much controversy, there is many times little inquiry. For this part of knowledge of method seemeth to me so weakly inquired, as I shall report it deficient.

Method hath been placed, and that not amiss, in logic, as a part of judgment: for as the doctrine of syllogisms comprehendeth the

rules of judgment upon that which is invented, so the doctrine of method containeth the rules of judgment upon that which is to be delivered; for judgment precedeth delivery, as it followeth invention. Neither is the method or the nature of the tradition material only to the use of knowledge, but likewise to the progression of knowledge: for since the labour and life of one man cannot attain to perfection of knowledge, the wisdom of the tradition is that which inspireth the felicity of continuance and proceeding. And therefore the most real diversity of method, is of method referred to use, and method referred to progression, whereof the one may be termed magistral, and the other of probation.

The latter whereof seemeth to be *via deserta et interclusa*. For as knowledges are now delivered, there is a kind of contract of error, between the deliverer and the receiver; for he that delivereth knowledge, desireth to deliver it in such form as may be best believed, and not as may be best examined: and he that receiveth knowledge, desireth rather present satisfaction, than expectant inquiry: and so rather not to doubt, than not to err; glory making the author not to lay open his weakness, and sloth making the disciple not to know his strength.

But knowledge, that is delivered as a thread to be spun on, ought to be delivered and intimated, if it were possible, in the same method wherein it was invented, and so is it possible of knowledge induced. But in this same anticipated and prevented knowledge, no man knoweth how he came to the knowledge which he hath obtained. But yet nevertheless, *secundum majus et minus*, a man may revisit and descend unto the foundations of his knowledge and consent; and so transplant it into another as it grew in his own mind. For it is in knowledges, as it is in plants, if you mean to use the plant, it is no matter for the roots; but if you mean to remove it to grow, then it is more assured to rest upon roots than slip;: so the delivery of knowledges, as it is now used, is as of fair bogies of trees without the roots; good for the carpenter, but not for the planter. But if you will have sciences grow, it is less matter for the shaft or body of the tree, so you look well to the taking up of the roots: of which kind of delivery the method of the mathematics, in that subject, hath some shadow; but generally I see it neither put in use nor put in inquisition, and therefore note it for deficient.

Another diversity of method there is, which hath some affinity with the former, used in some cases by the discretion of the ancients, but disgraced since by the impostures of many vain persons, who have made it as a false light for their counterfeit merchandizes; and that is, enigmatical and disclosed. The pretence whereof is to remove the vulgar capacities from being admitted to the secrets of knowledges, and to reserve them to selected auditors, or wits of such sharpness as can pierce the veil.

Another diversity of method, whereof the consequence is great, is the delivery of knowledge in aphorisms, or in methods; wherein we may observe, that it hath been too much taken into custom, out of a few axioms or observations upon any subject to make a solemn and

formal art, filling it with some discourses, and illustrating it with examples, and digesting it into a sensible method ; but the writings in aphorisms hath many excellent virtues, whereto the writing in method doth not approach.

For first it trieth the writer, whether he be superficial or solid : for aphorisms, except they should be ridiculous, cannot be made but of the pith and heart of sciences ; for discourse of illustration is cut off, recitals of examples are cut off ; discourse of connection and order is cut off ; descriptions of practice are cut off ; so there remaineth nothing to fill the aphorisms, but some good quantity of observation : and therefore no man can suffice, nor in reason will attempt to write aphorisms, but he that is sound and grounded. But in methods,

Tantum series juncturaque pollet,
Tantum de medio sumptis accedit honoris ;

as a man shall make a great show of an art, which, if it were disjointed, would come to little. Secondly, methods are more fit to win consent or belief, but less fit to point to action ; for they carry a kind of demonstration in orb or circle, one part illuminating another, and therefore satisfy. But particulars being dispersed, do best agree with dispersed directions. And lastly, aphorisms, representing a knowledge broken, do invite men to inquire farther ; whereas methods carrying the show of a total, do secure men as if they were at farthest.

Another diversity of method, which is likewise of great weight, is the handling of knowledge by assertions, and their proofs ; or by questions, and their determinations ; the latter kind whercof, if it be immoderately followed, is prejudicial to the proceeding of learning, as it is to the proceeding of an army to go about to besiege every little fort or hold. For if the field be kept, and the sum of the enterprise pursued, those smaller things will come in of themselves ; but indeed a man would not leave some important place of the enemy at his back. In like manner, the use of confutation in the delivery of sciences ought to be very sparing ; and to serve to remove strong preoccupations and prejudgments, and not to minister and excite disputations and doubts.

Another diversity of methods is according to the subject or matter which is handled ; for there is a great difference in delivery of the mathematics, which are the most abstracted of knowledges, and policy, which is most immersed ; and howsoever contention hath been removed, touching the uniformity of method in multiformity of matter ; yet we see how that opinion, besides the weakness of it, hath been of ill desert towards learning, as that which taketh the way to reduce learning to certain empty and barren generalities ; being but the very husks and shells of sciences, all the kernel being forced out and expulsed with the torture and press of the method : And therefore as I did allow well of particular topics of invention, so do I allow likewise of particular methods of tradition.

Another diversity of judgment in the delivery and teaching of knowledge, is according unto the light and presuppositions of that

which is delivered ; for that knowledge which is new and foreign from opinions received, is to be delivered in another form than that that is agreeable and familiar ; and therefore Aristotle, when he thinks to tax Democritus, doth in truth commend him, where he saith, “ If we shall indeed dispute, and not follow after similitudes,” etc. For those, whose conceits are seated in popular opinions, need only but to prove or dispute ; but those whose conceits are beyond popular opinions, have a double labour ; the one to make themselves conceived, and the other to prove and demonstrate : so that it is of necessity with them to have recourse to similitudes and translations to express themselves. And therefore in the infancy of learning, and in rude times, when those conceits which are now trivial were then new, the world was full of parables and similitudes ; for else would men either have passed over without mark, or else rejected for paradoxes, that which was offered, before they had understood or judged. So in divine learning, we see how frequent parables and tropes are : for it is a rule, “ That whatsoever science is not consonant to presuppositions, must pray in aid of similitudes.”

There be also other diversities of methods vulgar and received : as that of resolution or *analysis*, of constitution or *systasis*, of concealment or cryptic, etc., which I do allow well of, though I have stood upon those which are least handled and observed. All which I have remembered to this purpose, because I would erect and constitute one general inquiry, which seems to me deficient, touching the wisdom of tradition.

But unto this part of knowledge concerning method, doth farther belong, not only the architecture of a whole frame of work, but also the several beams and columns thereof, not as to their stuff, but as to their quantity and figure : and therefore method considereth not only the disposition of the argument or subject, but likewise the propositions ; not as to their truth or matter, but as to their limitation and manner. For herein Ramus merited better a great deal in reviving the good rules and propositions, *καθόλου πρώτον κατὰ παντός*, etc. than he did in introducing the canker of epitomes ; and yet, as it is the condition of human things, that, according to the ancient fables, “ The most precious things have the most pernicious keepers ;” it was so, that the attempt of the one made him fall upon the other. For he had need be well conducted, that should design to make axioms convertible ; if he make them not withal circular, and *non promovent* or incurring into themselves : but yet the intention was excellent.

The other considerations of method concerning propositions are chiefly touching the utmost propositions, which limit the dimensions of sciences ; for every knowledge may be fitly said, besides the profundity, which is the truth and substance of it that makes it solid, to have a longitude and a latitude, accounting the latitude towards other sciences, and the longitude towards action ; that is, from the greatest generality, to the most particular precept : The one giveth rule how far one knowledge ought to intermeddle within the province of another which is the rule they call *καθ'αυτό* : the other giveth rule unto what degree of particularity a knowledge should descend : which latter I find passed over in silence, being in my judgment the more material : for cer-

tainly there must be somewhat left to practice ; but how much is worthy the inquiry. We see remote and superficial generalities do but offer knowledge to scorn of practical men, and are no more aiding to practice, than an Ortelius's universal map is to direct the way between London and York. The better sort of rules have been not unfitly compared to glasses of steel unpolished ; where you may see the images of things, but first they must be filed : so the rules will help, if they be laboured and polished by practice. But how crystalline they may be made at the first, and how far forth they may be polished aforehand, is the question ; the inquiry whereof seemeth to me deficient.

There hath been also laboured, and put in practice, a method, which is not a lawful method, but a method of imposture, which is, to deliver knowledges in such a manner as men may speedily come to make a show of learning, who have it not : such was the travel of Raymondus Lullius in making that art, which bears his name, not unlike to some books of typocosmy which have been made since, being nothing but a mass of words of all arts, to give men countenance, that those which use the terms might be thought to understand the art ; which collections are much like a fripper's or broker's shop, that hath ends of everything, but nothing of worth.

Now we descend to that part which concerneth the illustration of tradition, comprehended in that science which we call Rhetoric, or art of eloquence ; a science excellent, and excellently well laboured. For although in true value it is inferior to wisdom, as it is said by God to Moses, when he disabled himself for want of this faculty, "Aaron shall be thy speaker, and thou shalt be to him as God : " Yet with people it is the more mighty : for so Solomon saith, "*Sapiens corde appellabitur prudens, sed dulcis eloquio majora reperiet ;*" signifying, that profoundness of wisdom will help a man to a name or admiration, but that it is eloquence that prevaieth in an active life ; and as to the labouring of it, the emulation of Aristotle with the rhetoricians of his time, and the experience of Cicero, hath made them in their works of rhetorics exceed themselves. Again, the excellency of examples of eloquence in the orations of Demosthenes and Cicero, added to the perfection of the precepts of eloquence, hath doubled the progression in this art : and therefore the deficiencies which I shall note, will rather be in some collections, which may as handmaids attend the art, than in the rules or use of the art itself.

Notwithstanding, to stir the earth a little about the roots of this science, as we have done of the rest ; the duty and office of rhetoric is to apply reason to imagination for the better moving of the will : for we see reason is disturbed in the administration thereof by three means : by illaqueation or sophism, which pertains to logic ; by imagination or impression, which pertains to rhetoric ; and by passion or affection, which pertains to morality. And as in negotiation with others, men are wrought by cunning, by importunity, and by vehemency ; so in this negotiation within ourselves, men are undermined by inconsequences, solicited and importuned by impressions or observations, and transported by passions. Neither is the nature of man so

unfortunately built, as that those powers and arts should have force to disturb reason, and not to establish and advance it; for the end of logic is to teach a form of argument to secure reason, and not to entrap it. The end of morality, is to procure the affections to obey reason, and not to invade it. The end of rhetoric, is to fill the imagination to second reason, and not to oppress it; for these abuses of arts come in but *ex obliquo* for caution.

And therefore it was great injustice in Plato, though springing out of a just hatred of the rhetoricians of his time, to esteem of rhetoric but as a voluptuary art, resembling it to cookery, that did mar wholesome meats, and help unwholesome by variety of sauces, to the pleasure of the taste. For we see that speech is much more conversant in adorning that which is good, than in colouring that which is evil; for there is no man but speaketh more honestly than he can do or think; and it was excellently noted by Thucydides in Cleon, that because he used to hold on the bad side in causes of estate, therefore he was ever inveighing against eloquence and good speech, knowing that no man can speak fair of courses sordid and base. And therefore as Plato said elegantly, "That Virtue, if she could be seen, would move great love and affection:" so seeing that she cannot be showed to the sense by corporal shape, the next degree is, to show her to the imagination in lively representation: for to show her to reason only in subtilty of argument, was a thing ever derided in Chrysippus, and many of the Stoics, who thought to thrust virtue upon men by sharp disputations and conclusions, which have no sympathy with the will of man.

Again, if the affections in themselves were pliant and obedient to reason, it were true, there should be no great use of persuasions and insinuations to the will, more than of naked proposition and proofs: but in regard of the continual mutinies and seditions of the affections,

Video meliora, proboque;
Deteriora sequor;

Reason would become captive and servile, if eloquence of persuasions did not practise and win the imagination from the affections' part, and contract a confederacy between the reason and imagination against the affections; for the affections themselves carry ever an appetite to good, as reason doth. The difference is, that the affection beholdeth merely the present, reason beholdeth the future and sum of time. And therefore the present filling the imagination more, reason is commonly vanquished; but after that force of eloquence and persuasion hath made things future and remote appear as present, then upon the revolt of the imagination reason prevaieth.

We conclude therefore, that rhetoric can be no more charged with the colouring of the worst part, than logic with sophistry, or morality with vice. For we know the doctrines of contraries are the same, though the use be opposite. It appeareth also, that logic differeth from rhetoric, not only as the fist from the palm, the one close, the other at large; but much more in this, that logic handleth reason exact, and in truth: and rhetoric handleth it as it is planted in popular

opinions and manners. And therefore Aristotle doth wisely place rhetoric as between logic on the one side, and moral or civil knowledge on the other, as participating of both : for the proofs and demonstrations of logic are toward all men indifferent and the same : but the proofs and persuasions of rhetoric ought to differ according to the auditors :

Orpheus in sylvis, inter delphinas Arion.

Which application, in perfection of idea, ought to extend so far, that if a man should speak of the same thing to several persons, he should speak to them all respectively, and several ways : though this politic part of eloquence in private speech, it is easy for the greatest orators to want ; whilst by the observing their well graced forms of speech, they lose the volubility of application : and therefore it shall not be amiss to recommend this to better inquiry, not being curious whether we place it here, or in that part which concerneth policy.

Now therefore will I descend to the deficiencies, which, as I said, are but attendances : and first, I do not find the wisdom and diligence of Aristotle well pursued, who began to make a collection of the popular signs and colours of good and evil, both simple and comparative, which are as the sophisms of rhetoric, as I touched before. For example ;

SOPHISMA.

Quod laudatur, bonum : quod vituperatur, malum.

REDARGUTIO.

Laudat venales qui vult extrudere merces.

Malum est, malum est, inquit emptor ; sed cum recesserit, tum gloriabitur.

The defects in the labour of Aristotle are three ; one, that there be but a few of many ; another, that their elenchus's are not annexed ; and the third, that he conceived but a part of the use of them : for their use is not only in probation, but much more in impression. For many forms are equal in signification, which are differing in impression ; as the difference is great in the piercing of that which is sharp, and that which is flat, though the strength of the percussion be the same : for there is no man but will be a little more raised by hearing it said ; " Your enemies will be glad of this ; "

Hoc Ithacus velit, et magno mercentur Atridæ ;

than by hearing it said only ; " This is evil for you."

Secondly, I do resume also that which I mentioned before, touching provision or preparatory store, for the furniture of speech and readiness of invention, which appeareth to be of two sorts ; the one in resemblance to a shop of pieces unmade up, the other to a shop of things ready made up, both to be applied to that which is frequent and most in request : the former of these I will call *antitheta*, and the latter *formulae*.

Antitheta are *theses* argued *pro et contra*, wherein men may be more large and laborious ; but, in such as are able to do it, to avoid pro-

lixity of entry, I wish the seeds of the several arguments to be cast up into some brief and acute sentences, not to be cited, but to be as scanes or bottoms of thread, to be unwinded at large when they come to be used ; supplying authorities and examples by reference.

PRO VERBIS LEGIS.

Non est interpretatio, sed divinatio, quæ recedit a litera.
Cum receditur a litera iudex transit in legislatorem.

PRO SENTENTIA LEGIS.

Ex omnibus verbis est eliciendus sensus, qui interpretatur singula.

Formule are but decent and apt passages or conveyances of speech, which may serve indifferently for differing subjects ; as of preface, conclusion, digression, transition, excusation, etc. For as in buildings there is great pleasure and use in the well-casting of the staircases, entries, doors, windows, and the like ; so in speech, the conveyances and passages are of special ornament and effect.

A CONCLUSION IN A DELIBERATIVE.

So may we redeem the faults passed, and prevent the inconveniences future.

There remain two *appendices* touching the tradition of knowledge, the one critical, the other pedantical ; for all knowledge is either delivered by teachers, or attained by men's proper endeavours : and therefore as the principal part of tradition of knowledge concerneth chiefly writing of books, so the relative part thereof concerneth reading of books : whereunto appertain incidently these considerations. The first is concerning the true correction and edition of authors, wherein nevertheless rash diligence hath done great prejudice. For these critics have often presumed that that which they understand not, is false set down. As the priest, that where he found it written of St. Paul, "*Demissus est per sportam*," mended his book, and made it "*Demissus est per portam*," because *sporta* was an hard word, and out of his reading : and surely their errors, though they be not so palpable and ridiculous, yet are of the same kind. And therefore as it hath been wisely noted, the most corrected copies are commonly the least correct.

The second is concerning the exposition and explication of authors, which resteth in annotations and commentaries, wherein it is over usual to blanch the obscure places, and discourse upon the plain.

The third is concerning the times, which in many cases give great light to true interpretations.

The fourth is concerning some brief censure and judgment of the authors, that men thereby may make some election unto themselves what books to read.

And the fifth is concerning the syntax and disposition of studies, that men may know in what order or pursuit to read.

For pedantical knowledge, it containeth that difference of tradition

which is proper for youth, whereunto appertain divers considerations of great fruit.

As first the timing and seasoning of knowledges ; as with what to initiate them, and from what, for a time, to refrain them.

Secondly, the consideration where to begin with the easiest, and so proceed to the more difficult, and in what courses to press the more difficult, and then to turn them to the more easy ; for it is one method to practise swimming with bladders, and another to practise dancing with heavy shoes.

A third is the application of learning according unto the propriety of the wits ; for there is no defect in the faculties intellectual but seemeth to have a proper cure contained in some studies : as for example, if a child be bird-witted, that is, hath not the faculty of attention, the mathematics giveth a remedy thereunto, for in them, if the wit be caught away but a moment, one is new to begin : and as sciences have a propriety towards faculties for cure and help, so faculties or powers have a sympathy towards sciences for excellency or speedy profiting ; and therefore it is an inquiry of great wisdom what kinds of wits and natures are most proper for what sciences.

Fourthly, the ordering of exercises is matter of great consequence to hurt or help : for, as is well observed by Cicero, men in exercising their faculties, if they be not well advised, do exercise their faults, and get ill habits as well as good ; so there is a great judgment to be had in the continuance and intermission of exercises. It were too long to particularize a number of other considerations of this nature ; things but of mean appearance, but of singular efficacy : for as the wronging or cherishing of seeds or young plants, is that that is most important to their thriving ; and as it was noted, that the first six kings, being in truth as tutors of the state of Rome in the infancy thereof, was the principal cause of the immense greatness of that state which followed ; so the culture and manurance of minds in youth hath such a forcible, though unseen, operation, as hardly any length of time or contention of labour can countervail it afterwards. And it is not amiss to observe also, how small and mean faculties gotten by education, yet when they fall into great men or great matters, do work great and important effects ; whereof we see a notable example in Tacitus, of two stage players, Percennius and Vibulenus, who by their faculty of playing put the Pannonian armies into an extreme tumult and combustion ; for there arising a mutiny amongst them, upon the death of Augustus Cæsar, Blæsus the lieutenant had committed some of the mutineers, which were suddenly rescued ; whereupon Vibulenus got to be heard speak, which he did in this manner : " These poor innocent wretches appointed to cruel death, you have restored to behold the light : but who shall restore my brother to me, or life unto my brother, that was sent hither in message from the legions of Germany, to treat of the common cause ? And he hath murdered him this last night by some of his fencers and ruffians, that he hath about him for his executioners upon soldiers. Answer, Blæsus, what is done with his body ? The mortalest enemies do not deny burial ; when I have performed my last

duties to the corpse with kisses, with tears, command me to be slain besides him, so that these my fellows, for our good meaning and our true hearts to the legions, may have leave to bury us." With which speech he put the army into an infinite fury and uproar; whereas truth was he had no brother, neither was there any such matter, but he played it merely as if he had been upon the stage.

But to return, we are now come to a period of rational knowledges, wherein if I have made the divisions other than those that are received, yet would I not be thought to disallow all those divisions which I do not use; for there is a double necessity imposed upon me of altering the divisions. The one, because it differeth in end and purpose, to sort together those things which are next in nature, and those things which are next in use; for if a secretary of estate should sort his papers, it is like in his study, or general cabinet, he would sort together things of a nature, as treaties, instructions, etc. but in his boxes, or particular cabinet, he would sort together those that he were like to use together, though of several natures; so in this general cabinet of knowledge it was necessary for me to follow the divisions of the nature of things; whereas if myself had been to handle any particular knowledge I would have respected the divisions fittest for use. The other, because the bringing in of the deficiencies did by consequence alter the partitions of the rest: for let the knowledge extant, for demonstration sake, be fifteen, let the knowledge with the deficiencies be twenty, the parts of fifteen are not the parts of twenty, for the parts of fifteen are three and five, the parts of twenty are two, four, five and ten; so as these things are without contradiction, and could not otherwise be.

WE proceed now to that knowledge which considereth of the Appetite and Will of Man, whereof Solomon saith, "*Ante omnia, fili, custodi cor tuum, nam inde procedunt actiones vitæ.*" In the handling of this science, those which have written seem to me to have done as if a man that professed to teach to write, did only exhibit fair copies of alphabets, and letters joined, without giving any precepts or directions for the carriage of the hand and framing of the letters; so have they made good and fair exemplars and copies, carrying the draughts and portraitures of good, virtue, duty, felicity; propounding them well described as the true objects and scopes of man's will and desires; but how to attain these excellent marks, and how to frame and subdue the will of man to become true and conformable to these pursuits, they pass it over altogether, or slightly and unprofitably; for it is not the disputing that moral virtues are in the mind of man by habit and not by nature, or the distinguishing that generous spirits are won by doctrines and persuasions, and the vulgar sort by reward and punishment, and the like scattered glances and touches, that can excuse the absence of this part.

The reason of this omission I suppose to be that hidden rock whereupon both this and many other barks of knowledge have been cast away; which is, that men have despised to be conversant in

ordinary and common matters, the judicious direction whereof nevertheless is the wisest doctrine; for life consisteth not in novelties nor subtilities: but contrariwise they have compounded sciences chiefly of a certain resplendent or lustrous mass of matter, chosen to give glory either to the subtlety of disputations, or to the eloquence of discourses. But Seneca giveth an excellent check to eloquence: "*Nocet illis eloquentia, quibus non rerum cupiditatem facit, sed sui.*" Doctrine should be such as should make men in love with the lesson, and not with the teacher, being directed to the auditor's benefit, and not to the author's commendation; and therefore those are of the right kind which may be concluded as Demosthenes concludes his counsel, "*Quæ si feceritis, non oratorem duntaxat in præsentia laudabitis, sed vosmet ipsos etiam, non ita multo post statu rerum vestrarum meliore.*" Neither needed men of so excellent parts to have despaired of a fortune, which the poet Virgil promised himself, and indeed obtained, who got as much glory of eloquence, wit, and learning in the expressing of the observations of husbandry, as of the heroical acts of Æneas:

*Nec sum animi dubius, verbis ea vincere magnum
Quam sit, et angustis hunc addere rebus honorem.*

Georg. iii. 289.

And surely if the purpose be in good earnest not to write at leisure that which men may read at leisure, but really to instruct and suborn action and active life, these georgics of the mind concerning the husbandry and tillage thereof, are no less worthy than the heroical descriptions of virtue, duty, and felicity. Wherefore the main and primitive division of moral knowledge seemeth to be into the Exemplar or Platform of Good, and the Regiment or Culture of the Mind; the one describing the nature of good, the other prescribing rules how to subdue, apply, and accommodate the will of man thereunto.

The doctrine touching the Platform or Nature of Good considereth it either simple or compared, either the kinds of good, or the degrees of good; in the latter whereof those infinite disputations which were touching the supreme degree thereof, which they term felicity, beatitude, or the highest good, the doctrines concerning which were as the heathen divinity, are by the Christian faith discharged. And, as Aristotle saith, "That young men may be happy, but not otherwise but by hope;" so we must all acknowledge our minority, and embrace the felicity which is by hope of the future world.

Freed therefore, and delivered from this doctrine of the philosophers' heaven, whereby they feigned an higher elevation of man's nature than was, for we see in what an height of style Seneca writeth, "*Vere magnum, habere fragilitatem hominis, securitatem Dei,*" we may with more sobriety and truth receive the rest of their inquiries and labours; wherein for the nature of good, positive or simple, they have set it down excellently, in describing the forms of virtue and duty with their situations and postures, in distributing them into their kinds, parts, provinces, actions, and administrations, and the like;

may farther, they have commended them to man's nature and spirit, with great quickness of argument and beauty of persuasions; yea, and fortified and entrenched them, as much as discourse can do, against corrupt and popular opinions. Again, for the degrees and comparative nature of good, they have also excellently handled it in their triplicity of good, in the comparison between a contemplative and an active life, in the distinction between virtue with reluctance, and virtue secured, in their encounters between honesty and profit, in their balancing of virtue with virtue, and the like; so as this part deserveth to be reported for excellently laboured.

Notwithstanding if before they had come to the popular and received notions of virtue and vice, pleasure and pain, and the rest, they had stayed a little longer upon the inquiry concerning the roots of good and evil, and the strings of those roots, they had given, in my opinion, a great light to that which followed; and specially if they had consulted with nature, they had made their doctrines less prolix and more profound: which being by them in part omitted and in part handled with much confusion, we will endeavour to resume and open in a more clear manner.

There is formed in everything a double nature of good, the one as everything is a total or substantive in itself, the other as it is a part or member of a greater body; whereof the latter is in degree the greater and the worthier, because it tendeth to the conservation of a more general form: therefore we see the iron in particular sympathy moveth to the loadstone, but yet if it exceed a certain quantity, it forsaketh the affection to the loadstone, and like a good patriot moveth to the earth, which is the region and country of massy bodies; so may we go forward and see that water and massy bodies move to the centre of the earth, but rather than to suffer a divulsion in the continuance of nature they will move upwards from the centre of the earth, forsaking their duty to the earth in regard of their duty to the world. This double nature of good and the comparative thereof is much more engraven upon man, if he degenerate not, unto whom the conservation of duty to the public ought to be much more precious than the conservation of life and being; according to that memorable speech of Pompeius Magnus, when being in commission of purveyance for a famine at Rome, and being dissuaded with great vehemency and instance by his friends about him, that he should not hazard himself to sea in an extremity of weather, he said only to them "*Necesse est ut eam, non ut vivam:*" but it may be truly affirmed that there was never any philosophy, religion, or other discipline, which did so plainly and highly exalt the good which is communicative, and depress the good which is private and particular, as the holy faith: well declaring, that it was the same God that gave the Christian law to men, who gave those laws of nature to inanimate creatures that we spake of before; for we read that the elected saints of God have wished themselves anathematized and razed out of the book of life, in an ecstasy of charity, and infinite feeling of communion.

This being set down and strongly planted, doth judge and determine most of the controversies wherein moral philosophy is conversant. For first, it decideth the question touching the preferment of the contemplative or active life, and decideth it against Aristotle : for all the reasons which he bringeth for the contemplative, are private, and respecting the pleasure and dignity of a man's self, in which respects, no question, the contemplative life hath the pre-eminence ; not much unlike to that comparison, which Pythagoras made for the gracing and magnifying of philosophy and contemplation ; who being asked what he was, answered, "That if Hiero were ever at the Olympian games, he knew the manner, that some came to try their fortune for the prizes, and some came as merchants to utter their commodities, and some came to make good cheer and meet their friends, and some came to look on, and that he was one of them that came to look on." But men must know, that in this theatre of man's life, it is reserved only for God and angels to be lookers on : neither could the like question ever have been received in the Church, notwithstanding their "*Pretiosa in oculis Domini mors sanctorum ejus*;" by which place they would exalt their civil death and regular professions, but upon this defence, that the monastical life is not simply contemplative, but performeth the duty either of incessant prayers and supplications, which hath been truly esteemed as an office in the Church, or else of writing or taking instructions for writing concerning the law of God ; as Moses did when he abode so long in the mount. And so we see Enoch the seventh from Adam, who was the first contemplative, and walked with God ; yet did also endow the Church with prophecy, which St. Jude citeth. But for contemplation which should be finished in itself, without casting beams upon society, assuredly divinity knoweth it not.

It decideth also the controversies between Zeno and Socrates, and their schools and successions on the one side, who placed felicity in virtue simply or attended ; the actions and exercises whereof do chiefly embrace and concern society ; and on the other side, the Cyrenaics and Epicureans, who placed it in pleasure, and made virtue, as it is used in some comedies of errors, wherein the mistress and the maid change habits, to be but as a servant, without which pleasure cannot be served and attended : and the reformed school of the Epicureans, which placed it in serenity of mind and freedom from perturbation ; as if they would have deposed Jupiter again, and restored Saturn and the first age, when there was no summer nor winter, spring nor autumn, but all after one air and season ; and Herillus, who placed felicity in extinguishment of the disputes of the mind, making no fixed nature of good and evil, esteeming things according to the clearness of the desires, or the reluctance ; which opinion was revived in the heresy of the Anabaptists, measuring things according to the motions of the spirit, and the constancy or wavering of belief : all which are manifest to tend to private repose and contentment, and not to point of society.

It censureth also the philosophy of Epictetus, which presupposeth that felicity must be placed in those things which are in our power, lest we be liable to fortune and disturbance ; as if it were not a thing

much more happy to fail in good and virtuous ends for the public, than to obtain all that we can wish to ourselves in our proper fortune; as Consalvo said to his soldiers, showing them Naples and protesting, "He had rather die one foot forwards, than to have his life secured for long, by one foot of retreat." Whereunto the wisdom of that heavenly leader hath signed, who hath affirmed "that a good conscience is a continual feast;" showing plainly, that the conscience of good intentions, howsoever succeeding, is a more continual joy to nature, than all the provision that can be made for security and repose.

It censureth likewise that abuse of philosophy, which grew general about the time of Epictetus, in converting it into an occupation or profession; as if the purpose had been not to resist or extinguish perturbations, but to fly and avoid the causes of them, and to shape a particular kind and course of life to that end, introducing such an health of mind, as was that health of body of which Aristotle speaketh of Herodicus, who did nothing all his life long but intend his health: whereas if men refer themselves to duties of society, as that health of body is best, which is ablest to endure all alterations and extremities; so likewise that health of mind is most proper, which can go through the greatest temptations and perturbations. So as Diogenes's opinion is to be accepted, who commended not them which abstained, but them which sustained, and could refrain their mind in *præcipitio*, and could give unto the mind, as is used in horsemanship, the shortest stop or turn.

Lastly, it censureth the tenderness and want of application in some of the most ancient and reverend philosophers and philosophical men, that did retire too easily from civil business, for avoiding of indignities and perturbations; whereas the resolution of men truly moral, ought to be such as the same Consalvo said the honour of a soldier should be, *e tela crassiore*, and not so fine, as that everything should catch in it and endanger it.

To resume private or particular good, it falleth into the division of good active and passive: for this difference of good, not unlike to that which amongst the Romans was expressed in the familiar or household terms of *Promus* and *Condus*, is formed also in all things, and is best disclosed in the two several appetites in creatures; the one to preserve or continue themselves, and the other to dilate or multiply themselves; whereof the latter seemeth to be worthier; for in nature the heavens, which are the more worthy, are the agent; and the earth, which is the less worthy, is the patient: in the pleasures of living creatures, that of generation is greater than that of food: in divine doctrine, "Beatius est dare, quam accipere:" and in life there is no man's spirit so soft, but esteemeth the effecting of somewhat that he hath fixed in his desire, more than sensuality. Which priority of the active good is much upheld by the consideration of our estate to be mortal and exposed to fortune: for if we might have a perpetuity and certainty in our pleasures, the state of them would advance their price; but when we see it is but "*Magni æstimamus mori tardius*," and "*Ne glorieris de crastino, nescis partum dici*," it maketh us to desire to

have somewhat secured and exempted from time, which are only our deeds and works; as it is said "*Opera eorum sequuntur eos.*" The pre-eminence likewise of this active good is upheld by the affection which is natural in man towards variety and proceeding, which in the pleasures of the sense, which is the principal part of passive good, can have no great latitude. "*Cogita quamdiu eadem feceris : cibus, somnus, ludus; per hunc circulum curritur. Mori velle non tantum fortis, aut miser, aut prudens, sed etiam fastidiosus potest.*" But in enterprises, pursuits, and purposes of life, there is much variety, whereof men are sensible with pleasure in their inceptions, progressions, recoils, re-integrations, approaches and attainings, to their ends. So as it was well said, "*Vita sine proposito languida et vaga est.*" Neither hath this active good any identity with the good of society, though in some case it hath an incidence into it : for although it do many times bring forth acts of beneficence, yet it is with a respect private to a man's own power, glory, amplification, continuance; as appeareth plainly, when it findeth a contrary subject. For that gigantic state of mind which possesseth the troublers of the world, such as was Lucius Sylla, and infinite other in smaller model, who would of all men happy or unhappy as they were their friends or enemies, and would give form to the world according to their own humours, which is the true theomachy, pretendeth, and aspireth to active good, though it recedeth farthest from good of society, which we have determined to be the greater.

To resume passive good, it receiveth a subdivision of conservative and perfective. For let us take a brief review of that which we have said; we have spoken first of the good of society, the intention whereof embraceth the form of human nature, whereof we are members and portions, and not our own proper and individual form; we have spoken of active good, and supposed it as a part of private and particular good. And rightly, for there is impressed upon all things a triple desire or appetite proceeding from love to themselves; one of preserving and continuing their form; another of advancing and perfecting their form; and a third of multiplying and extending their form upon other things; whereof the multiplying or signature of it upon other things, is that which we handled by the name of active good. So as there remaineth the conserving of it, and perfecting or raising of it; which latter is the highest degree of passive good. For to preserve in state is the less, to preserve with advancement is the greater. So in man,

Igneus est ollis vigor, et cœlestis origo.

His approach or assumption to divine or angelical nature is the perfection of his form; the error or false imitation of which good, is that which is the tempest of human life, while man, upon the instinct of an advancement formal and essential, is carried to seek an advancement local. For as those which are sick, and find no remedy, do tumble up and down and change place, as if by a remove local they could obtain a remove internal : so is it with men in ambition, when failing of the

means to exalt their nature, they are in a perpetual estuation to exalt their place. So then passive good is, as was said, either conservative or perfective.

To resume the good of conservation or comfort, which consisteth in the fruition of that which is agreeable to our natures ; it seemeth to be the most pure and natural of pleasures, but yet the softest and the lowest. And this also receiveth a difference, which hath neither been well judged of nor well inquired. For the good of fruition and contentment, is placed either in the sincereness of the fruition, or in the quickness and vigour of it ; the one superinduced by equality, the other by vicissitude ; the one having less mixture of evil, the other more impression of good. Whether of these is the greater good, is a question controverted ; but whether man's nature may not be capable of both, is a question not inquired.

The former question being debated between Socrates and a sophist, Socrates placing felicity in an equal and constant peace of mind, and the sophist in much desiring and much enjoying, they fell from argument to ill words : the sophist saying that Socrates's felicity was the felicity of a block or stone ; and Socrates saying that the sophist's felicity was the felicity of one that had the itch, who did nothing but itch and scratch. And both these opinions do not want their supports : for the opinion of Socrates is much upheld by the general consent even of the Epicures themselves, that virtue beareth a great part in felicity : and if so, certain it is, that virtue hath more use in clearing perturbations, than in compassing desires. The sophist's opinion is much favoured by the assertion we last spake of, that good of advancement is greater than good of simple preservation ; because every obtaining a desire hath a show of advancement, as motion though in a circle hath a show of progression.

But the second question decided the true way maketh the former superfluous : for can it be doubted but that there are some who take more pleasure in enjoying pleasures, than some other, and yet nevertheless are less troubled with the loss or leaving of them : so as this same, "*Non uti, ut non appetas ; non appetere, ut non metuas ; sunt animi pusilli et diffidentis.*" And it seemeth to me that most of the doctrines of the philosophers are more fearful and cautionary than the nature of things requireth : so have they increased the fear of death in offering to cure it : for when they would have a man's whole life to be but a discipline or preparation to die, they must needs make men think that it is a terrible enemy against whom there is no end of preparing. Better saith the poet,

Qui finem vitæ extremum inter munera ponat
Nature :

So have they sought to make men's minds too uniform and harmonical, by not breaking them sufficiently to contrary motions : the reason whereof I suppose to be, because they themselves were men dedicated to a private, free, and unapplied course of life. For as we see, upon the lute or like instrument, a ground, though it be sweet and have

show of many changes, yet breaketh not the hand to such strange and hard stops and passages, as a set song or voluntary: much after the same manner was the diversity between a philosophical and a civil life. And therefore men are to imitate the wisdom of jewellers, who if there be a grain, or a cloud, or an ice which may be ground forth without taking too much of the stone, they help it; but if it should lessen and abate the stone too much, they will not meddle with it; so ought men so to procure serenity, as they destroy not magnanimity.

Having therefore deduced the good of man, which is private and particular, as far as seemeth fit, we will now return to that good of man which respecteth and beholdeth Society, which we may term duty; because the term of duty is more proper to a mind well framed and disposed towards others, as the term of virtue is applied to a mind well formed and composed in itself; though neither can a man understand virtue without some relation to society, nor duty without an inward disposition. This part may seem at first to pertain to science civil and politic, but not if it be well observed; for it concerneth the regiment and government of every man over himself, and not over others. And as in architecture the direction of the framing the posts, beams, and other parts of building, is not the same with the manner of joining them and erecting the building; and in mechanicals, the direction how to frame an instrument or engine, is not the same with the manner of setting it on work and employing it; and yet nevertheless in expressing of the one, you incidentally express the aptness towards the other: so the doctrine of conjugation of men in society differeth from that of their conformity thereunto.

This part of duty is subdivided into two parts; the common duty of every man as a man or member of a state, the other the respective or special duty of every man in his profession, vocation, and place. The first of these is extant and well laboured, as hath been said. The second likewise I may report rather dispersed, than deficient; which manner of dispersed writing in this kind of argument I acknowledge to be best: who can take upon him to write of the proper duty, virtue, challenge, and right of every several vocation, profession, and place? For although sometimes a looker on may see more than a gamester, and there be a proverb more arrogant than sound, "That the vale best discovereth the hills;" yet there is small doubt but that men can write best, and most really and materially in their own professions; and that the writing of speculative men of active matter, for the most part, doth seem to men of experience, as Phormio's argument of the wars seemed to Hannibal, to be but dreams and dotage. Only there is one vice which accompanieth them that write in their own professions, that they magnify them in excess; but generally it were to be wished, as that which would make learning indeed solid and fruitful, that active men would or could become writers.

In which I cannot but mention, *honoris causa*, your majesty's excellent book touching the duty of a king, a work richly compounded of divinity, morality, and policy, with great aspersion of all other arts, and being in mine opinion one of the most sound and healthful writings

that I have read, not distempered in the heat of invention, nor in the coldness of negligence ; not sick of business, as those are who lose themselves in their order, nor of convulsions, as those which cramp in matters impertinent ; not savouring of perfumes and paintings, as those do who seek to please the reader more than nature beareth ; and chiefly well disposed in the spirits thereof, being agreeable to truth, and apt for action, and far removed from that natural infirmity whereunto I noted those that write in their own professions to be subject, which is, that they exalt it above measure : for your majesty hath truly described, not a king of Assyria, or Persia, in their extern glory, but a Moses, or a David, pastors of their people. Neither can I ever lose out of my remembrance, what I heard your majesty in the same sacred spirit of government deliver in a great cause of judicature, which was, "That kings ruled by their laws as God did by the laws of nature, and ought as rarely to put in use their supreme prerogative, as God doth his power of working miracles." And yet, notwithstanding, in your book of a free monarchy, you do well give men to understand, that you know the plenitude of the power and right of a king, as well as the circle of his office and duty. Thus have I presumed to alledge this excellent writing of your majesty, as a prime or eminent example of Tractates concerning special and respective duties, wherein I should have said as much if it had been written a thousand years since : neither am I moved with certain courtly decencies, which esteem it flattery to praise in presence ; no, it is flattery to praise in absence, that is, when either the virtue is absent, or the occasion is absent, and so the praise is not natural but forced, either in truth or in time. But let Cicero be read in his oration *pro Marcello*, which is nothing but an excellent table of Cæsar's virtue, and made to his face ; besides the example of many other excellent persons wiser a great deal than such observers, and we will never doubt, upon a full occasion, to give just praises to present or absent.

But to return, there belongeth farther to the handling of this part, touching the duties of professions and vocations, a relative or opposite touching the frauds, cautels, impostures, and vices of every profession, which hath been likewise handled. But how ? Rather in a satire and cynically, than seriously and wisely ; for men have rather sought by wit to deride and traduce much of that which is good in professions, than with judgment to discover and sever that which is corrupt. For, as Solomon saith, he that cometh to seek after knowledge with a mind to scorn and censure, shall be sure to find matter for his humour, but no matter for his instruction : "Quærenti derisori scientiam, ipsa se abscondit : sed studioso fit obviam." But the managing of this argument with integrity and truth, which I note as deficient, seemeth to me to be one of the best fortifications for honesty and virtue that can be planted. For, as the fable goeth of the basilisk, that if he see you first, you die for it ; but if you see him first, he dieth : so is it with deceits and evil arts, which, if they be first espied, lose their life ; but if they prevent, they endanger. So that we are much beholden to Machiavel and others, that write what men do, and not what they ought to do :

for it is not possible to join serpentine wisdom with the columbine innocency, except men know exactly all the conditions of the serpent; his baseness and going upon his belly, his volubility and lubricity, his envy and sting, and the rest; that is, all forms and natures of evil: for without this, virtue lieth open and unfenced. Nay, an honest man can do no good upon those that are wicked, to reclaim them, without the help of the knowledge of evil: for men of corrupted minds presuppose that honesty groweth out of simplicity of manners, and believing of preachers, schoolmasters, and men's exterior language. So as, except you can make them perceive that you know the utmost reaches of their own corrupt opinions, they despise all morality; "*Non recipit stultus verba prudentia, nisi ea dixeris, quæ versantur in corde ejus.*"

Unto this part touching respective duty doth also appertain the duties between husband and wife, parent and child, master and servant: so likewise the laws of friendship and gratitude, the civil bond of companies, colleges, and politic bodies of neighbourhood, and all other proportionate duties; not as they are parts of government and society, but as to the framing of the mind of particular persons.

The knowledge concerning good respecting society doth handle it also not simply alone, but comparatively, whereunto belongeth the weighing of duties between person and person, case and case, particular and public: as we see in the proceeding of Lucius and Brutus against his own sons, which was so much extolled; yet what was said?

Infelix, utcunque ferent ea fata minores.

So the case was doubtful, and had opinion on both sides. Again, we see when M. Brutus and Cassius invited to a supper certain whose opinions they meant to feel, whether they were fit to be made their associates, and cast forth the question touching the killing of a tyrant being an usurper, they were divided in opinion, some holding that servitude was the extreme of evils, and others that tyranny was better than a civil war; and a number of the like cases there are of comparative duty: amongst which that of all others is the most frequent, where the question is of a great deal of good to ensue of a small injustice, which Jason of Thessalia determined against the truth: "*Aliqua sunt injuste facienda, ut multa juste fieri possint.*" But the reply is good, "*Auctorem præsentis justitiæ habes, sponsorem futuræ non habes;*" men must pursue things which are just in present, and leave the future to the divine providence. So then we pass on from this general part touching the exemplar and description of good.

Now therefore that we have spoken of this fruit of life, it remaineth to speak of the husbandry that belongeth thereunto, without which part the former seemeth to be no better than a fair image, or *statua*, which is beautiful to contemplate, but is without life and motion: whereunto Aristotle himself subscribeth in these words, "*Necesse est scilicet de virtute dicere, et quid sit, et ex quibus gignatur.* Inutile enim fere fuerit, virtutem quidem nosse, acquirendæ

autem ejus modos et vias ignorare : non enim de virtute tantum, qua specie sit, quaerendum est, sed et quomodo sui copiam faciat ; utrumque enim volumus, et rem ipsam nosse et ejus compotes fieri ; hoc autem ex voto non succedet, nisi sciamus et ex quibus et quomodo.' In such full words and with such iteration doth he inculcate this part : so saith Cicero in great commendation of Cato the second, that he had applied himself to philosophy, "non ita disputandi causa, sed ita vivendi." And although the neglect of our times, wherein few men do hold any consultations touching the reformation of their life, as Seneca excellently saith, "De partibus vitæ quisque deliberat, de summa nemo," may make this part seem superfluous ; yet I must conclude with that aphorism of Hippocrates, "Qui gravi morbo correpti dolores non sentiunt, iis mens agrotat ;" they need medicine not only to assuage the disease, but to awake the sense. And if it be said, that the cure of men's minds belongeth to sacred divinity, it is most true : but yet moral philosophy may be preferred unto her as a wise servant and humble handmaid. For as the Psalm saith, that "the eyes of the handmaid look perpetually towards the mistress," and yet no doubt many things are left to the discretion of the handmaid, to discern of the mistress's will ; so ought moral philosophy to give a constant attention to the doctrines of divinity, and yet so as it may yield of herself, within due limits, many sound and profitable directions.

This part therefore, because of the excellency thereof, I cannot but find exceeding strange that it is not reduced to written inquiry, the rather because it consisteth of much matter, wherein both speech and action is often conversant, and such wherein the common talk of men, which is rare, but yet cometh sometimes to pass, is wiser than their books. It is reasonable therefore that we propound it in the more particularity, both for the worthiness, and because we may acquit ourselves for reporting it deficient, which seemeth almost incredible, and is otherwise conceived and presupposed by those themselves that have written. We will therefore enumerate some heads or points thereof, that it may appear the better what it is, and whether it be extant.

First, therefore, in this, as in all things which are practical, we ought to cast up our account, what is in our power, and what not ; for the one may be dealt with by way of alteration, but the other by way of application only. The husbandman cannot command, neither the nature of the earth, nor the seasons of the weather, no more can the physician the constitution of the patient, nor the variety of accidents. So in the culture and cure of the mind of man, two things are without our command ; points of nature, and points of fortune ; for to the basis of the one, and the conditions of the other, our work is limited and tied. In these things therefore, it is left unto us to proceed by application ;

Vincenda est omnis fortuna ferendo :

and so likewise,

Vincenda est omnis natura ferendo.

But when that we speak of suffering, we do not speak of a dull and

neglected suffering, but of a wise and industrious suffering which draweth and contriveth use and advantage out of that which seemeth adverse and contrary, which is that properly which we call accommodating or applying. Now the wisdom of application resteth principally in the exact and distinct knowledge of the precedent state or disposition, unto which we do apply; for we cannot fit a garment, except we first take measure of the body.

So then the first article of this knowledge is to set down sound and true distributions, and descriptions of the several characters and tempers of men's natures and dispositions, specially having regard to those differences which are most radical, in being the fountains and causes of the rest, or most frequent in concurrence or commixture; wherein it is not the handling of a few of them in passage, the better to describe the mediocrities of virtues, that can satisfy this intention: for if it deserve to be considered, "that there are minds which are proportioned to great matters, and others to small," which Aristotle handleth or ought to have handled by the name of magnanimity, doth it not deserve as well to be considered, "that there are minds proportioned to intend many matters, and others to few?" So that some can divide themselves, others can perchance do exactly well, but it must be but in few things at once; and so there cometh to be a narrowness of mind, as well as a pusillanimity. And again, "that some minds are proportioned to that which may be despatched at once, or within a short return of time; others to that which begins afar off, and is to be won with length of pursuit,"

———*Jam tum tenditque fovetque.*

So that there may be fitly said to be a longanimity, which is commonly ascribed to God, as a magnanimity. So farther deserved it to be considered by Aristotle, "that there is a disposition in conversation, supposing it in things which do in no sort touch or concern a man's self, to sooth and please; and a disposition contrary to contradict and cross;" and deserveth it not much better to be considered, "that there is a disposition, not in conversation or talk, but in matter of more serious nature, and supposing it still in things merely indifferent, to take pleasure in the good of another, and a disposition contrariwise, to take distaste at the good of another;" which is that properly which we call good-nature or ill-nature, benignity or malignity. And therefore I cannot sufficiently marvel, that this part of knowledge, touching the several characters of natures and dispositions, should be omitted both in morality and policy, considering it is of so great ministry and suppeditation to them both. A man shall find in the traditions of astrology some pretty and apt divisions of men's natures, according to the predominances of the planets; lovers of quiet, lovers of action, lovers of victory, lovers of honour, lovers of pleasure, lovers of arts, lovers of charge, and so forth. A man shall find in the wisest sort of these relations, which the Italians make touching conclaves, the natures of the several cardinals handsomely and lively painted forth; a man shall meet with, in every day's conference, the denominations of

sensitive, dry, formal, real, humourous, certain, "*huomo di prima impressione, huomo di ultima impressione*," and the like : and yet nevertheless this kind of observations wandereth in words, but is not fixed in inquiry. For the distinctions are found, many of them, but we conclude no precepts upon them : wherein our fault is the greater, because both history, poesy, and daily experience, are as goodly fields where these observations grow ; whereof we make a few poesies to hold in our hands, but no man bringeth them to the confectionary, that receipts might be made of them for the use of life.

Of much like kind are those impressions of nature, which are imposed upon the mind by the sex, by the age, by the region, by health and sickness, by beauty and deformity, and the like, which are inherent, and not extern ; and again, those which are caused by extern fortune ; as sovereignty, nobility, obscure birth, riches, want, magistracy, privateness, prosperity, adversity, constant fortune, variable fortune, rising *per saltum per gradus*, and the like. And therefore we see that Plautus maketh it a wonder to see an old man beneficent, "*benignitas hujus ut adolescentuli est*." St. Paul concludeth, that severity of discipline was to be used to the Cretans, "*Increpa eos dure*," upon the disposition of their country, "*Cretenses semper mendaces, make bestiae, ventres pigri*." Sallust noteth, "that it is usual with kings to desire contradictories ;" "*Sed plerumque regiae voluntates, ut vehementes sunt, sic mobiles, saepeque ipsae sibi adversae*." Tacitus observeth how rarely raising of the fortune mendeth the disposition, "*Solus Vespasianus mutatus in melius*." Pindarus maketh an observation, that great and sudden fortune for the most part defeateth men, "*Qui magnam felicitatem concoquere non possunt*." So the Psalm showeth it is more easy to keep a measure in the enjoying of fortune, than in the increase of fortune : "*Divitiae si affluant, nolite cor apponere*." These observations, and the like, I deny not but are touched a little by Aristotle, as in passage in his Rhetorics, and are handled in some scattered discourses ; but they were never incorporate into moral philosophy to which they do essentially appertain ; as the knowledge of the diversity of grounds and moulds doth to agriculture, and the knowledge of the diversity of complexions and constitutions doth to the physician ; except we mean to follow the indiscretion of empirics, which minister the same medicines to all patients.

Another article of this knowledge, is the inquiry touching the affections ; for as in medicining of the body, it is in order first to know the divers complexions and constitutions ; secondly, the diseases ; and lastly, the cures ; so in medicining of the mind, after knowledge of the divers characters of men's natures, it followeth, in order, to know the diseases and infirmities of the mind, which are no other than the perturbations and distempers of the affections. For as the ancient politicians in popular estates were wont to compare the people to the sea, and the orators to the winds ; because as the sea would of itself be calm and quiet, if the winds did not move and trouble it ; so the people would be peaceable and tractable if the seditious orators did not set them in working and agitation : so it may be fitly said, that the mind

in the nature thereof would be temperate and stayed, if the affections, as winds, did not put it into tumult and perturbation. And here again I find strange as before, that Aristotle should have written divers volumes of Ethics, and never handled the affections, which is the principal subject thereof; and yet in his Rhetorics, where they are considered but collaterally, and in a second degree, as they may be moved by speech, he findeth place for them, and handleth them well for the quantity; but where their true place is, he pretermitteth them. For it is not his disputations about pleasure and pain that can satisfy this inquiry, no more than he that should generally handle the nature of light, can be said to handle the nature of colours; for pleasure and pain are to the particular affections as light is to particular colours. Better travels, I suppose, had the Stoics taken in this argument, as far as I can gather by that which we have at second hand. But yet, it is like, it was after their manner, rather in subtilty of definitions, which, in a subject of this nature, are but curiosities, than in active and ample descriptions and observations. So likewise I find some particular writings of an elegant nature, touching some of the affections; as of anger, of comfort upon adverse accidents, of tenderness, of countenance, and other. But the poets and writers of histories are the best doctors of this knowledge, where we may find painted forth with great life how affections are kindled and incited; and how pacified and refrained; and how again contained from act, and farther degree: how they disclose themselves; how they work; how they vary; how they gather and fortify; how they are inwrapped one within another; and how they do fight and encounter one with another; and other the like particularities. Amongst the which, this last is of special use in moral and civil matters: how, I say, to set affection against affection, and to master one by another, even as we use to hunt beast with beast, and fly bird with bird, which otherwise percase we could not so easily recover: upon which foundation is erected that excellent use of *premium* and *pæna*, whereby civil states consist, employing the predominant affections of fear and hope, for the suppressing and bridling the rest. For, as in the government of states, it is sometimes necessary to bridle one faction with another, so it is in the government within.

Now come we to those points which are within our own command, and have force and operation upon the mind, to affect the will and appetite, and to alter manners: wherein they ought to have handled custom, exercise, habit, education, example, imitation, emulation, company, friends, praise, reproof, exhortation, fame, laws, books, studies: these as they have determinate use in moralities, for from these the mind suffereth, and of these are such receipts and regiments compounded and described, as may serve to recover or preserve the health and good estate of the mind, as far as pertaineth to human medicine; of which number we will insist upon some one or two, as an example of the rest. because it were too long to prosecute all; and therefore we do resume custom and habit to speak of.

The opinion of Aristotle seemeth to me a negligent opinion, that of those things which consist by nature, nothing can be changed by cus-

tom ; using for example, that if a stone be thrown ten thousand times up, it will not learn to ascend, and that by often seeing or hearing, we do not learn to hear or see the better. For though this principle be true in things wherein nature is peremptory, the reason whereof we cannot now stand to discuss, yet it is otherwise in things wherein nature admitteth a latitude. For he might see that a straight glove will come more easily on with use ; and that a wand will by use bend otherwise than it grew ; and that by use of the voice we speak louder and stronger ; and that by use of enduring heat or cold, we endure it the better, and the like ; which latter sort have a nearer resemblance unto that subject of manners he handleth, than those instances which he alledgeth. But allowing his conclusion, that virtues and vices consist in habit, he ought so much the more to have taught the manner of superinducing that habit : for there be many precepts of the wise ordering the exercises of the mind, as there is of ordering the exercises of the body, whereof we will recite a few.

The first shall be, that we beware we take not at the first either too high a strain, or too weak : for if too high in a diffident nature you discourage ; in a confident nature you breed an opinion of facility, and so a sloth : and in all natures you breed a farther expectation than can hold out, and so an insatisfaction in the end : if too weak of the other side, you may not look to perform and overcome any great task.

Another precept is, to practise all things chiefly at two several times, the one when the mind is best disposed, the other when it is worst disposed ; that by the one you may give a great step, by the other you may work out the knots and stonds of the mind, and make the middle times the more easy and pleasant.

Another precept is that which Aristotle mentioneth by the way, which is, to bear ever towards the contrary extreme of that whereunto we are by nature inclined : like unto the rowing against the stream, or making a wand straight, by binding him contrary to his natural crookedness.

Another precept is, that the mind is brought to anything better, and with more sweetness and happiness, if that whereunto you pretend be not first in the intention, but *tanquam aliud agendo*, because of the natural hatred of the mind against necessity and constraint. Many other axioms there are touching the managing of exercise and custom ; which being so conducted, doth prove indeed another nature ; but being governed by chance, doth commonly prove but an ape of nature, and bringeth forth that which is lame and counterfeit.

So if we should handle books and studies, and what influence and operation they have upon manners, are there not divers precepts of great caution and direction appertaining thereunto ? Did not one of the fathers in great indignation call poesy *vinum dæmonum*, because it increaseth temptations, perturbations, and vain opinions ? Is not the opinion of Aristotle worthy to be regarded, wherein he saith, " That young men are no fit auditors of moral philosophy, because they are not settled from the boiling heat of their affections, nor attempered with time and experience ? " And doth it not hereof come, that those

excellent books and discourses of the ancient writers, whereby they have persuaded unto virtue most effectually, by representing her in state and majesty ; and popular opinions against virtue in their parasites coats, fit to be scorned and derided, are of so little effect towards honesty of life, because they are not read, and revolved by men in their mature and settled years, but confined almost to boys and beginners? But is it not true also, that much less young men are fit auditors of matters of policy, till they have been thoroughly seasoned in religion and morality, lest their judgments be corrupted, and made apt to think that there are no true differences of things, but according to utility and fortune, as the verse describes it?

Prosperum et felix scelus virtus vocatur.

And again,

Ille crucem pretium sceleris tulit, hic diadema :

which the poets do speak satirically, and in indignation on virtue's behalf : but books of policy do speak it seriously and positively ; for it so pleaseth Machiavel to say, "that if Cæsar had been overthrown, he would have been more odious than ever was Catiline : " as if there had been no difference, but in fortune, between a very fury of lust and blood, and the most excellent spirit, his ambition reserved, of the world? Again, is there not a caution likewise to be given of the doctrines of moralities themselves, some kinds of them, lest they make men too precise, arrogant, incompatible, as Cicero saith of Cato in Marco Catone : "Hæc bona, quæ videmus, divina et egregia, ipsius scitote esse propria : quæ nonnunquam requirimus, ea sunt omnia non a natura, sed a magistro?" Many other axioms and advices there are touching those proprieties and effects, which studies do infuse and instil into manners. And so likewise is there touching the use of all those other points, of company, fame, laws, and the rest, which we recited in the beginning in the doctrine of morality.

But there is a kind of culture of the mind that seemeth yet more accurate and elaborate than the rest, and is built upon this ground : that the minds of all men are sometimes in a state more perfect, and at other times in a state more depraved. The purpose, therefore, of this practice is, to fix and cherish the good hours of the mind, and to obliterate and take forth the evil. The fixing of the good hath been practised by two means, vows or constant resolutions, and observances or exercises ; which are not to be regarded so much in themselves, as because they keep the mind in continual obedience. The obliteration of the evil hath been practised by two means, some kind of redemption or expiation of that which is past, and an inception or account *de novo*, for the time to come : but this part seemeth sacred and religious, and justly ; for all good moral philosophy, as was said, is but an handmaid to religion.

Wherefore we will conclude with that last point, which is of all other means the most compendious and summary ; and, again, the most noble and effectual to the reducing of the mind unto virtue and good estate ; which is, the electing and propounding unto a man's self

good and virtuous ends of his life, such as may be in a reasonable sort within his compass to attain. For if these two things be supposed, that a man set before him honest and good ends, and again that he be resolute, constant, and true unto them; it will follow, that he shall mould himself into all virtue at once. And this is indeed like the work of nature, whereas the other course is like the work of the hand: for as when a carver makes an image, he shapes only that part whereupon he worketh, as if he be upon the face, that part which shall be the body is but a rude stone still, till such time as he comes to it: but, contrariwise, when nature makes a flower or living creature, she formeth rudiments of all the parts at one time: so in obtaining virtue by habit, while a man practiseth temperance, he doth not profit much to fortitude, nor the like; but when he dedicateth and applieth himself to good ends, look, what virtue soever the pursuit and passage towards those ends doth commend unto him, he is invested of a precedent disposition to conform himself thereunto. Which state of mind Aristotle doth excellently express himself, that it ought not to be called virtuous, but divine: his words are these, "*Immanitati autem consentaneum est, opponere eam, quæ supra humanitatem est, heroicam sive divinam virtutem.*" And a little after, "*Nam ut feræ neque vitium neque virtus est, sic neque Dei.* Sed hic quidem status altius quiddam virtute est, ille aliud quiddam a vitio." And therefore we may see what celsitude of honour Plinius Secundus attributeth to Trajan in his funeral oration; where he said, "that men needed make no other prayers to the gods, but that they would continue as good lords to them as Trajan had been;" as if he had not been only an imitation of divine nature, but a pattern of it. But these be heathen and profane passages, having but a shadow of that divine state of mind, which religion and the holy faith doth conduct men unto, by imprinting upon their souls charity, which is excellently called *the bond of perfection*, because it comprehendeth and fasteneth all virtues together. And as it is elegantly said by Menander, of vain love, which is but a false imitation of divine love, "*Amor melior sophista lævo ad humanam vitam,*" that love teacheth a man to carry himself better than the sophist or preceptor, which he calleth left-handed, because, with all his rules and preceptions, he cannot form a man so dexterously, nor with that facility, to prize himself, and govern himself, as love can do: so certainly if a man's mind be truly inflamed with charity, it doth work him suddenly into greater perfection than all the doctrine of morality can do, which is but a sophist in comparison of the other. Nay farther, as Xenophon observed truly, that all other affections, though they raise the mind, yet they do it by distorting and uncomeliness of ecstasies or excesses; but only love doth exalt the mind, and nevertheless at the same instant doth settle and compose it: so in all other excellencies, though they advance nature, yet they are subject to excess. Only charity admitteth no excess; for so we see by aspiring to be like God in power the angels transgressed and fell; "*Ascendam, et ero similis Altissimo;*" by aspiring to be like God in knowledge man transgressed and fell; "*Eritis sicut Dii, scientes bonum et malum:*" but by aspiring to a similitude of God

in goodness, or love, neither man nor angel ever transgressed, or shall transgress. For unto that imitation we are called; "Diligite inimicos vestros, benefacite eis qui oderunt vos, et orate pro persequentibus et calumniantibus vos, ut sitis filii Patris vestri, qui in cœlis est, qui solem suum oriri facit super bonos et malos, et pluit super justos et injustos." So in the first platform of the divine nature itself, the heathen religion speaketh thus, "Optimus Maximus;" and the sacred Scriptures thus, "Misericordia ejus super omnia opera ejus."

Wherefore I do conclude this part of moral knowledge, concerning the culture and regiment of the mind; wherein if any man, considering the parts thereof, which I have enumerated, do judge that my labour is but to collect into an art or science that which hath been pretermitted by others, as matters of common sense and experience, he judgeth well: but as Philocrates sported with Demosthenes, "You may not marvel, Athenians, that Demosthenes and I do differ, for he drinketh water, and I drink wine." And like as we read of an ancient parable of the two gates of sleep,

Sunt geminæ somni portæ, quarum altera fertur
Cornea, qua veris facilis datur exitus umbris :
Altera candenti perfecta nitens elephanto,
Sed falsa ad cœlum mittunt insomnia manes :

so if we put on sobriety and attention, we shall find it a sure maxim in knowledge, that the more pleasant liquor, of wine, is the more vaporous, and the braver gate of ivory sendeth forth the falser dreams.

But we have now concluded that general part of human philosophy which contemplateth man segregate, and as he consisteth of body and spirit. Wherein we may farther note, that there seemeth to be a relation or conformity between the good of the mind and the good of the body. For as we divided the good of the body into health, beauty, strength, and pleasure; so the good of the mind, inquired in rational and moral knowledges, tendeth to this, to make the mind sound and without perturbation; beautiful and graced with decency; and strong and agile for all duties of life. These three, as in the body, so in the mind, seldom meet, and commonly sever. For it is easy to observe, that many have strength of wit and courage, but have neither health from perturbations, nor any beauty or decency in their doings: some again have an elegancy and fineness of carriage, which have neither soundness of honesty, nor substance of sufficiency: and some again have honest and reformed minds, that can neither become themselves nor manage business. And sometimes two of them meet, and rarely all three. As for pleasure, we have likewise determined, that the mind ought not to be reduced to stupidity, but to retain pleasure; confined rather in the subject of it, than in the strength and vigour of it.

CIVIL Knowledge is conversant about a subject which of all others is most immersed in matter, and hardliest reduced to axiom. Nevertheless, as Cato the Censor said, "that the Romans were like sheep, for that a man might better drive a flock of them, than one of them; for in a flock, if you could get but some few to go right, the rest would

follow?" so in that respect moral philosophy is more difficile than policy. Again, moral philosophy propoundeth to itself the framing of internal goodness; but civil knowledge requireth only an external goodness; for that as to society sufficeth. And therefore it cometh oft to pass that there be evil times in good governments: for so we find in the holy story, when the kings were good; yet it is added, "*Sed adhuc populus non direxerat cor suum ad Dominum Deum patrum suorum.*" Again, states, as great engines, move slowly, and are not so soon put out of frame: for as in Egypt the seven good years sustained the seven bad, so governments for a time well grounded, do bear out errors following. But the resolution of particular persons is more suddenly subverted. These respects do somewhat qualify the extreme difficulty of civil knowledge.

This knowledge hath three parts, according to the three summary actions of society, which are, Conversation, Negotiation, and Government. For man seeketh in society comfort, use, and protection: and they be three wisdoms of divers natures, which do often sever; wisdom of behaviour, wisdom of business, and wisdom of state.

The wisdom of conversation ought not to be over much affected, but much less despised: for it hath not only an honour in itself, but an influence also into business and government. The poet saith, "*Nec vultu destrue verba tuo.*" A man may destroy the force of his words with his countenance: so may he of his deeds, saith Cicero, recommending to his brother affability and easy access, "*Nil interest habere ostium apertum, vultum clausum.*" It is nothing won to admit men with an open door, and to receive them with a shut and reserved countenance. So, we see, Atticus, before the first interview between Cæsar and Cicero, the war depending, did seriously advise Cicero touching the composing and ordering of his countenance and gesture. And if the government of the countenance be of such effect, much more is that of the speech, and other carriage appertaining to conversation; the true model whereof seemeth to me well expressed by Livy, though not meant for this purpose; "*Ne aut arrogans videar, aut obnoxius; quorum alterum est alienæ libertatis oblitus, alterum suæ.*" "The sum of behaviour is to retain a man's own dignity, without intruding upon the liberty of others." On the other side, if behaviour and outward carriage be intended too much, first it may pass into affectation, and then "*Quid deformius quam scenam in vitam transferre,*" to act a man's life? But although it proceed not to that extreme, yet it consumeth time, and employeth the mind too much. And therefore as we use to advise young students from company keeping, by saying, "*Amici, fures temporis;*" so certainly the intending of the discretion of behaviour is a great thief of meditation. Again, such as are accomplished in that form of urbanity, please themselves in it, and seldom aspire to higher virtue; whereas those that have defect in it, do seek comeliness by reputation; for where reputation is, almost everything becometh; but where that is not, it must be supplied by puntos and compliments. Again, there is no greater impediment of action, than an over-curious observance of decency, and the guide of

decency, which is time and season. For as Solomon saith, "*Qui respicit ad ventos, non seminat ; et qui respicit ad nubes, non metit :*" a man must make his opportunity as oft as find it. To conclude ; behaviour seemeth to me as a garment of the mind, and to have the conditions of a garment. For it ought to be made in fashion ; it ought not to be too curious ; it ought to be shaped so as to set forth any good making of the mind, and hide any deformity ; and above all, it ought not to be too strait, or restrained for exercise or motion. But this part of civil knowledge hath been elegantly handled, and therefore I cannot report it for deficient.

The wisdom touching Negotiation or Business hath not been hitherto collected into writing, to the great derogation of learning, and the professors of learning. For from this root springeth chiefly that note or opinion, which by us is expressed in adage to this effect ; that there is no great concurrence between learning and wisdom. For of the three wisdoms which we have set down to pertain to civil life, for wisdom of behaviour, it is by learned men for the most part despised, as an inferior to virtue, and an enemy to meditation ; for wisdom of government, they acquit themselves well when they are called to it, but that happeneth to few ; but for the wisdom of business, wherein man's life is most conversant, there be no books of it, except some few scattered advertisements, that have no proportion to the magnitude of this subject. For if books were written of this, as the other, I doubt not but learned men, with mean experience, would far excel men of long experience, without learning, and outshoot them in their own bow.

Neither needeth it at all to be doubted, that this knowledge should be so variable, as it falleth not under precept ; for it is much less infinite than science of government, which, we see, is laboured, and in some part reduced. Of this wisdom, it seemeth, some of the ancient Romans, in the saddest and wisest times, were professors ; for Cicero reporteth, that it was then in use for senators that had name and opinion for general wise men, as Coruncanius, Curius, Lælius, and many others, to walk at certain hours in the place, and to give audience to those that would use their advice ; and that the particular citizens would resort unto them, and consult with them of the marriage of a daughter, or of the employing of a son, or of a purchase or bargain, or of an accusation, and every other occasion incident to man's life. So as there is a wisdom of counsel and advice even in private cases, arising out of an universal insight into the affairs of the world ; which is used indeed upon particular cases propounded, but is gathered by general observation of cases of like nature. For so we see in the book which Q. Cicero writeth to his brother, "*De petitione consulatus,*" being the only book of business, that I know, written by the ancients, although it concerned a particular action then on foot, yet the substance thereof consisteth of many wise and politic axioms, which contain not a temporary, but a perpetual direction in the case of popular elections. But chiefly we may see in those aphorisms which have place amongst divine writings, composed by Solomon the king, of whom the Scriptures testify, that his heart was as the sands of the sea, encom-

passing the world and all worldly matters : we see, I say, not a few profound and excellent cautions, precepts, positions, extending to much variety of occasions ; whereupon we will stay a while, offering to consideration some number of examples.

Sed et cunctis sermonibus, qui dicuntur, ne accommodes aurem tuam, ne forte audias servum tuum maledicentem tibi.

Here is recommended the provident stay of inquiry of that which we would be loath to find : as it was judged great wisdom in Pompeius Magnus that he burned Sertorius's papers unperused.

Vir sapiens, si cum stulto contenderit, sive irascatur, sive rideat, non inveniet requiem.

Here is described the great disadvantage which a wise man hath in undertaking a lighter person than himself, which is such an engagement, as whether a man turn the matter to jest, or turn it to heat, or howsoever he change copy, he can no ways quit himself well of it.

Qui delicate a pueritia nutrit servum suum, postea sentiet eum contumacem

Here is signified, that if a man begin too high a pitch in his favours, it doth commonly end in unkindness and unthankfulness.

Vidisti virum velocem in opere suo, coram regibus stabit, nec erit inter ignobiles.

Here is observed, that of all virtues for rising to honour, quickness of despatch is the best ; for superiors many times love not to have those they employ too deep or too sufficient, but ready and diligent.

Vidi cunctos viventes, qui ambulant sub sole, cum adolescente secundo, qui consurgit pro eo.

Here is expressed that which was noted by Sylla first, and after him by Tiberius ; “ Plures adorant solem orientem, quam occidentum vel meridianum.”

Si spiritus potestatem habentis ascenderit super te, locum tuum ne dimiseris, quia curatio faciet cessare peccata maxima.

Here caution is given, that upon displeasure, retiring is of all courses the unfittest ; for a man leaveth things at worst, and depriveth himself of means to make them better.

Erat civitas parva, et pauci in ea viri ; venit contra eam rex magnus, et vadavit eam, instruxitque munitiones per gym, et perfecta est obsidio ; inventusque est in ea vir pauper et sapiens, et liberavit eam per sapientiam suam, et nullus deinceps recordatus est hominis illius pauperis.

Here the corruption of states is set forth, that esteem not virtue or merit longer than they have use of it.

Mollis responsio frangit iram.

Here is noted, that silence or rough answer exasperateth ; but an answer present and temperate pacifieth.

Iter pigrorum, quasi sepes spinarum.

Here is lively represented how laborious sloth proveth in the end ; for when things are deferred to the last instant, and nothing prepared

beforehand, every step findeth a brier or an impediment, which catcheth or stoppeth.

Melior est finis orationis, quam principium.

Here is taxed the vanity of formal speakers, that study more about prefaces and inducements, than upon the conclusions and issues of speech.

Qui cognoscit in judicio faciem, non bene facit; iste et pro buccella panis deseret veritatem.

Here is noted, that a judge were better be a briber, than a respecter of persons; for a corrupt judge offendeth not so lightly as a facile.

Vir pauper calumnians pauperes, similis est imbri vehementi, in quo paratur fames.

Here is expressed the extremity of necessitous extortions, figured in the ancient fable of the full and the hungry horse-leech.

Fons turbatus pede, et vena corrupta, est justus cadens coram impio.

Here is noted, that one judicial and exemplar iniquity in the face of the world, doth trouble the fountains of justice more than many particular injuries passed over by connivance.

Qui subtrahit aliquid a patre et a matre, et dicit hoc non esse peccatum, particeps est homicidii.

Here is noted, that whereas men in wronging their best friends, use to extenuate their fault, as if they might presume or be bold upon them, it doth contrariwise indeed aggravate their fault, and turneth it from injury to impiety.

Noli esse amicus homini iracundo, nec ambulato cum homine furioso.

Here caution is given, that in the election of our friends we do principally avoid those which are impatient, as those that will espouse us to many factions and quarrels.

Qui conturbat domum suam, possidebit ventum.

Here is noted, that in domestical separations and breaches men do promise to themselves quieting of their mind and contentment, but still they are deceived of their expectation, and it turneth to wind.

Filius sapiens lætificat patrem: filius vero stultus mœstitia est matri suæ.

Here is distinguished, that fathers have most comfort of the good proof of their sons; but mothers have most discomfort of their ill proof, because women have little discerning of virtue, but of fortune.

Qui celat delictum, quærit amicitiam; sed qui altero sermone, repetit separat fœderatos.

Here caution is given, that reconciliation is better managed by an amnesty, and passing over that which is past, than by apologies and excusations.

In omni opere bono erit abundantia; ubi autem verba sunt plurima, bi frequenter egestas

Here is noted that words and discourse abound most, where there is idleness and want.

Primus in sua causa justus ; sed venit altera pars, et inquit in eum.

Here is observed that in all causes the first tale possesseth much, in such sort, that the prejudice thereby wrought will be hardly removed, except some abuse or falsity in the information be detected.

Verba bilinguis quasi simplicia, et ipsa perveniunt ad interioria ventris.

Here is distinguished, that flattery and insinuation, which seemeth set and artificial, sinketh not far ; but that entereth deep which hath show of nature, liberty, and simplicity.

Qui erudit derisorem, ipse sibi injuriam facit ; et qui arguit impium, sibi maculam generat.

Here caution is given how we tender reprehension to arrogant and scornful natures, whose manner is to esteem it for contumely, and accordingly to return it.

Da sapienti occasionem, et addetur ei sapientia.

Here is distinguished the wisdom brought into habit, and that which is but verbal, and swimming only in conceit ; for the one upon the occasion presented is quickened and redoubled, the other is amazed and confused.

Quomodo in aquis resplendent vultus prospicientium, sic corda hominum manifesta sunt prudentibus.

Here the mind of a wise man is compared to a glass, wherein the images of all diversity of natures and customs are represented, from which representation proceedeth that application,

Qui sapit, innumeris moribus aptus erit.

Thus have I staid somewhat longer upon these sentences politic of Solomon than is agreeable to the proportion of an example, led with a desire to give authority to this part of knowledge, which I noted as deficient, by so excellent a precedent ; and have also attended them with brief observations, such as to my understanding offer no violence to the sense, though I know they may be applied to a more divine use : but it is allowed even in divinity, that some interpretations, yea, and some writings, have more of the eagle than other ; but taking them as instructions for life, they might have received large discourse, if I would have broken them and illustrated them by deducements and examples.

Neither was this in use only with the Hebrews, but it is generally to be found in the wisdom of the more ancient times : that as men found out any observation that they thought was good for life, they would gather it and express it in parable, or aphorism, or fable. But for fables, they were vicegerents and supplies where examples failed : now that the times abound with history, the aim is better when the mark is alive. And therefore the form of writing, which of all others is the

fittest for this variable argument of negotiation and occasions, is that which Machiavel chose wisely and aptly for government; namely discourse upon histories or examples: for knowledge drawn freshly, and in our view, out of particulars, knoweth the way best to particulars again; and it hath much greater life for practice when the discourse attendeth upon the example, than when the example attendeth upon the discourse. For this is no point of order, as it seemeth at first, but of substance: for when the example is the ground, being set down in an history at large, it is set down with all circumstances, which may sometimes control the discourse thereupon made, and sometimes supply it as a very pattern for action: whereas the examples alledged for the discourse's sake, are cited succinctly, and without particularity, and carry a servile aspect towards the discourse which they are brought in to make good.

But this difference is not amiss to be remembered, that as history of times is the best ground for discourse of government, such as Machiavel handleth, so history of lives is the most proper for discourse of business, because it is more conversant in private actions. Nay, there is a ground of discourse for this purpose fitter than them both, which is discourse upon letters; such as are wise and weighty, as many are of Cicero "ad Atticum," and others. For letters have a great and more particular representation of business than either chronicles or lives. Thus have we spoken both of the matter and form of this part of civil knowledge, touching negotiation, which we note to be deficient.

But yet there is another part of this part, which differeth as much from that whereof we have spoken, as *sapere* and *sibi sapere*; the one moving as it were to the circumference, the other to the centre: for there is a wisdom of counsel, and again there is a wisdom of pressing a man's own fortune, and they do sometimes meet, and often sever; for many are wise in their own ways that are weak for government or counsel; like ants, which is a wise creature for itself, but very hurtful for the garden. This wisdom the Romans did take much knowledge of: "Nam pel sapiens," saith the comical poet, "fingit fortunam sibi;" and it grew to an adage, "Faber quisque fortunæ propriæ:" and Livy attributeth it to Cato the first, "in hoc viro tanta vis animi et ingenii inerat, ut quocunque loco natus esset, sibi ipse fortunam facturus videretur."

This conceit or position, if it be too much declared and professed, hath been thought a thing impolitic and unlucky, as was observed in Timotheus the Athenian; who having done many great services to the estate in his government, and giving an account thereof to the people, as the manner was, did conclude every particular with this clause, "and in this Fortune had no part." And it came so to pass that he never prospered in anything he took in hand afterwards; for this is too high and too arrogant, savouring of that which Ezekiel saith of Pharaoh, "Dicis, Fluvius est meus, et ego feci memetipsum:" or of that which another prophet speaketh, that "men offer sacrifices to their nets and snares;" and that which the poet expresseth,

Dextra mihi Deus, et telum, quod missile libro,
Nunc adsint.

For these confidences were ever unhallowed and unblessed : and therefore those that were great politicians indeed ever ascribed their successes to their felicity, and not to their skill or virtue. For so Sylla surnamed himself *Felix* not *Magnus* : so Cæsar said to the master of the ship, "Cæsarem portas et fortunam ejus."

But yet nevertheless these positions, "Faber quisque fortunæ suæ ; Sapiens dominabitur astris ; Invia virtuti nulla est via ;" and the like, being taken and used as spurs to industry, and not as stirrups to insolency, rather for resolution than for presumption or outward declaration, have been ever thought sound and good, and are, no question, imprinted in the greatest minds, who are so sensible of this opinion, as they can scarce contain it within : As we see in Augustus Cæsar, who was rather diverse from his uncle, than inferior in virtue, how when he died, he desired his friends about him to give him a *Plaudite*, as if he were conscient to himself that he had played his part well upon the stage. This part of knowledge we do report also as deficient ; not but that it is practised too much, but it hath not been reduced to writing. And therefore lest it should seem to any that it is not comprehensible by axiom, it is requisite, as we did in the former, that we set down some heads or passages of it.

Wherein it may appear at the first a new and unwonted argument to teach men how to raise and make their fortune : a doctrine, wherein every man perchance will be ready to yield himself a disciple till he seeth difficulty ; for fortune layeth as heavy impositions as virtue, and it is as hard and severe a thing to be a true politician, as to be truly moral. But the handling hereof concerneth learning greatly, both in honour and in substance : In honour, because pragmatical men may not go away with an opinion that learning is like a lark, that can mount, and sing, and please herself, and nothing else ; but may know that she holdeth as well of the hawk, that can soar aloft, and can also descend and strike upon the prey. In substance, because it is the perfect law of inquiry of truth, "that nothing be in the globe of matter, which should not be likewise in the globe of crystal, or form ;" that is, that there be not anything in being and action, which should not be drawn and collected into contemplation and doctrine. Neither doth learning admire or esteem of this architecture of fortune, otherwise than as of an inferior work : for no man's fortune can be an end worthy of his being, and many times the worthiest men do abandon their fortune willingly for better respects ; but nevertheless fortune, as an organ of virtue and merit, deserveth the consideration.

First, therefore, the precept which I conceive to be most summary towards the prevailing in fortune, is to obtain that window which Momus did require ; who seeing in the frame of man's heart such angles and recesses, found fault there was not a window to look into them ; that is, to procure good informations of particulars touching persons, their natures, their desires and ends, their customs and fashions, their helps and advantages, and wherebv they chiefly stand ;

so again their weaknesses and disadvantages, and where they lie most open and obnoxious ; their friends, factions, and dependencies ; and again their opposites, enviers, competitors, their moods and times, "*Sola viri molles aditus et tempora noras ;*" their principles, rules, and observations, and the like : and this not only of persons but of actions, what are on foot from time to time, and how they are conducted, favoured, opposed, and how they import, and the like. For the knowledge of present actions is not only material in itself, but without it also the knowledge of persons is very erroneous ; for men change with the actions, and whilst they are in pursuit they are one, and when they return to their nature, they are another. These informations of particulars, touching persons and actions, are as the minor propositions in every active syllogism, for no excellency of observations, which are as the major propositions, can suffice to ground a conclusion if there be error and mistaking in the minors.

That this knowledge is possible, Solomon is our surety, who saith, "*Consilium in corde viri, tanquam aqua profunda, sed vir prudens exhauriet illud :*" And although the knowledge itself falleth not under precept, because it is of individuals, yet the instructions for the obtaining of it may.

We will begin therefore with this precept, according to the ancient opinion, that the sinews of wisdom are slowness of belief and distrust : that more trust be given to countenances and deeds than to words ; and in words rather to sudden passages and surprised words than to set and purposed words. Neither let that be feared which is said, *Fronti nulla fides* ; which is meant of a general outward behaviour, and not of the private and subtle motions and labours of the countenance and gesture ; which, as Q. Cicero elegantly saith, is *animi janua*, "the gate of the mind." None more close than Tiberius, and yet Tacitus saith of Gallus, "*Etenim vultu offensionem conjectaverat.*" So again, noting the differing character and manner of his commending Germanicus and Drusus in the senate, he saith, touching his fashion, wherein he carried his speech of Germanicus, thus ; "*Magis in speciem adornatis verbis, quam ut penitus sentire videretur ;*" but of Drusus thus, "*Paucioribus, sed intentior, et fida oratione :*" and in another place, speaking of this character of speech when he did anything that was gracious and popular, he saith, that in other things he was "*velut eluctantium verborum :*" but then again, "*Solutius vero loquebatur quando subveniret.*" So that there is no such artificer of dissimulation, nor no such commanded countenance, *vultus jussus*, that can sever from a feigned tale some of these fashions, either a more slight and careless fashion, or more set and formal, or more tedious and wandering, or coming from a man more drily and hardly.

Neither are deeds such assured pledges, as that they may be trusted without a judicious consideration of their magnitude and nature : "*Fraus sibi in parvis fidem præstruit, ut majore emolumento fullat :*" and the Italian thinketh himself upon the point to be bought and sold, when he is better used than he was wont to be, without manifest cause. For small favours, they do but lull men asleep both

as to caution and as to industry, and are, as Demosthenes calleth them, "*Alimenta socordiae*." So again we see how false the nature of some deeds are, in that particular which Mutianus practised upon Antonius Primus, upon that hollow and unfaithful reconciliation which was made between them : whereupon Mutianus advanced many of the friends of Antonius : "*simul amicis ejus præfecturas et tribunatus largitur*:" wherein, under pretence to strengthen him, he did desolate him, and won from him his dependencies.

As for words, though they be, like waters to physicians, full of flattery and uncertainty, yet they are not to be despised, specially with the advantage of passion and affection. For so we see Tiberius, upon a stinging and incensing speech of Agrippina, came a step forth of his dissimulation, when he said, "You are hurt because you do not reign;" of which Tacitus saith, "*Audita hæc raram occulti pectoris vocem elicere, correptamque Græco versu admonuit: ideo lædi, quia non regnaret*." And therefore the poet doth elegantly call passions, tortures, that urge men to confess their secrets :

Vino tortus et ira.

And experience showeth, there are few men so true to themselves, and so settled, but that sometimes upon heat, sometimes upon bravery, sometimes upon kindness, sometimes upon trouble of mind and weakness, they open themselves; specially if they be put to it with a counter-dissimulation, according to the proverb of Spain, "*Di mentira, y sacaras verdad*," "Tell a lie, and find a truth."

As for the knowing of men, which is at second hand from reports : men's weakness and faults are best known from their enemies, their virtues and abilities from their friends, their customs and times from their servants, their conceits and opinions from their familiar friends, with whom they discourse most. General fame is light, and the opinions conceived by superiors or equals are deceitful; for to such, men are more masked, "*Verior fama e domesticis emanat*."

But the soundest disclosing and expounding of men is, by their natures and ends; wherein the weakest sort of men are best interpreted by their natures, and the wisest by their ends. For it was both pleasantly and wisely said, though I think very untruly, by a nuncio of the pope, returning from a certain nation, where he served as lieger; whose opinion being asked touching the appointment of one to go in his place, he wished that in any case they did not send one that was too wise; because no very wise man would ever imagine, what they in that country were like to do : and certainly it is an error frequent for men to shoot over, and to suppose deeper ends, and more compass reaches than are : the Italian proverb being elegant, and for the most part true,

*Di dinari, di senno, e di fede,
Ce' nè manco che non credi :*

"There is commonly less money, less wisdom, and less good faith, than men do account upon."

But princes, upon a far other reason, are best interpreted by their

natures, and private persons by their ends : for princes being at the top of human desires, they have for the most part no particular ends whereto they aspire, by distance from which a man might take measure and scale of the rest of their actions and desires ; which is one of the causes that maketh their hearts more inscrutable. Neither is it sufficient to inform ourselves in men's ends and natures of the variety of them only, but also of the predominancy, what humour reigneth most, and what end is principally sought. For so we see, when Tigellinus saw himself out-stripped by Petronius Turpilianus in Nero's humours of pleasures ; "*metus ejus rimatur,*" he wrought upon Nero's fears, whereby he broke the other's neck.

But to all this part of inquiry, the most compendious way resteth in three things ; the first, to have general acquaintance and inwardness with those which have general acquaintance, and look most into the world ; and especially according to the diversity of business, and the diversity of persons, to have privacy and conversation with some one friend at least, which is perfect and well intelligenced in every several kind. The second is, to keep a good mediocrity in liberty of speech and secrecy : in most things liberty, secrecy where it importeth ; for liberty of speech inviteth and provoketh liberty to be used again, and so bringeth much to a man's knowledge ; and secrecy, on the other side, induceth trust and inwardness. The last is the reducing of a man's self to this watchful and serene habit, as to make account and purpose, in every conference and action, as well to observe as to act. For as Epictetus would have a philosopher in every particular action to say to himself, "*Et hoc volo, et etiam institutum servare :*" so a politic man in everything should say to himself, "*Et hoc volo, ac etiam aliquid addiscere.*" I have stayed the longer upon this precept of obtaining good information ; because it is a main part by itself, which answereth to all the rest. But above all things caution must be taken, that men have a good stay and hold of themselves, and that this much knowing do not draw on much meddling : for nothing is more unfortunate than light and rash intermeddling in many matters. So that this variety of knowledge tendeth in conclusion but only to this, to make a better and freer choice of those actions which may concern us, and to conduct them with the less error and the more dexterity.

The second precept concerning this knowledge, is for men to take good information touching their own persons, and well to understand themselves : knowing that, as St. James saith, though men look oft in a glass, yet they do suddenly forget themselves ; wherein as the divine glass is the word of God, so the politic glass is the state of the world, or times wherein we live, in the which we are to behold ourselves.

For men ought to take an impartial view of their own abilities and virtues ; and again of their wants and impediments ; accounting these with the most ; and those other with the least ; and from this view and examination, to frame the considerations following.

First, to consider how the constitution of their nature sorteth with the general state of the times ; which if they find agreeable and fit then in all things to give themselves more scope and liberty ; but if

differing and dissonant, then in the whole course of their life to be more close, retired, and reserved : as we see in Tiberius, who was never seen at a play, and came not into the senate in twelve of his last years ; whereas Augustus Cæsar lived ever in men's eyes, which Tacitus observeth : "*Alia Tiberio morum via.*"

Secondly, to consider how their nature sorteth with professions and courses of life, and accordingly to make election, if they be free ; and, if engaged, to make the departure at the first opportunity, as we see was done by duke Valentine, that was designed by his father to a sacerdotal profession, but quitted it soon after in regard of his parts and inclination ; being such nevertheless, as a man cannot tell well whether they were worse for a prince or for a priest.

Thirdly, to consider how they sort with those whom they are like to have competitors and concurrents, and to take that course wherein there is most solitude, and themselves like to be most eminent ; as Julius Cæsar did, who at first was an orator or pleader ; but when he saw the excellency of Cicero, Hortensius, Catulus, and others, for eloquence, and saw there was no man of reputation for the wars but Pompeius, upon whom the state was forced to rely ; he forsook his course begun toward a civil and popular greatness, and transferred his designs to a martial greatness.

Fourthly, in the choice of their friends and dependences, to proceed according to the composition of their own nature ; as we may see in Cæsar ; all whose friends and followers were men active and effectual, but not solemn, or of reputation.

Fifthly, to take special heed how they guide themselves by examples, in thinking they can do as they see others do ; whereas perhaps their natures and carriages are far differing. In which error it seemeth Pompey was, of whom Cicero saith, that he was wont often to say, "*Sylla potuit, ego non potero.*" Wherein he was much abused, the natures and proceedings of himself and his example being the unlikest in the world ; the one being fierce, violent, and pressing the fact ; the other solemn, and full of majesty and circumstance ; and therefore the less effectual.

But this precept touching the politic knowledge of ourselves, hath many other branches whereupon we cannot insist.

Next to the well understanding and discerning of a man's self, there followeth the well opening and revealing a man's self ; wherein we see nothing more usual than for the more able man to make the less show. For there is a great advantage in the well setting forth of a man's virtues, fortunes, merits ; and again, in the artificial covering of a man's weaknesses, defects, disgraces, staying upon the one, sliding from the other ; cherishing the one by circumstances, gracing the other by opposition, and the like ; wherein we see what Tacitus saith of Mutianus, who was the greatest politician of his time, "*Omnium, quæ dixerat, feceratque, arte quadam ostentator ;*" which requireth indeed some art, lest it turn tedious and arrogant ; but yet so, as ostentation, though it be to the first degree of vanity, seemeth to me rather a vice in manners than in policy : for as it is said, "*Audactur calum-*

niare, semper aliquid hæret ; ” so except it be in a ridiculous degree of deformity, “Audactur te vendita, semper aliquid hæret.” For it will stick with the more ignorant and inferior sort of men, though men of wisdom and rank do smile at it, and despise it ; and yet the authority won with many, doth countervail the disdain of a few. But if it be carried with decency and government, as with a natural, pleasant, and ingenuous fashion, or at times when it is mixed with some peril and unsafety, as in military persons, or at times when others are most envied ; or with easy and careless passage to it and from it, without dwelling too long, or being too serious ; or with an equal freedom of taxing a man’s self, as well as gracing himself ; or by occasion of repelling or putting down others’ injury or insolence ; it doth greatly add to reputation : and surely not a few solid natures that want this ventosity, and cannot sail in the height of the winds, are not without some prejudice and disadvantage by their moderation.

But for these flourishes and enhancements of virtue, as they are not perchance unnecessary, so it is at least necessary that virtue be not disvalued and embased under the just price, which is done in three manners ; by offering and obtruding a man’s self, wherein men think he is rewarded, when he is accepted : by doing too much, which will not give that which is well done leave to settle, and in the end induceth satiety : and by finding too soon the fruit of a man’s virtue in commendation, applause, honour, favour ; wherein if a man be pleased with a little, let him hear what is truly said ; “Cave ne insuetus rebus majoribus videaris, si hæc te res parva, sicut magna, delectat.”

But the covering of defects is of no less importance than the valuing of good parts : which may be done likewise in three manners, by caution, by colour, and by confidence. Caution is, when men do ingeniously and discreetly avoid to be put into those things for which they are not proper : whereas contrariwise, bold and unquiet spirits will thrust themselves into matters without difference, and so publish and proclaim all their wants : colour is, when men make a way for themselves, to have a construction made of their faults or wants, as proceeding from a better cause, or intended for some other purpose : for of the one it is well said,

Sæpe latet vitium proximitate boni.

And therefore whatsoever want a man hath, he must see that he pretend the virtue that shadoweth it ; as if he be dull, he must affect gravity ; if a coward, mildness ; and so the rest. For the second, a man must frame some probable cause why he should not do his best and why he should dissemble his abilities ; and for that purpose must use to dissemble those abilities which are notorious in him, to give colour that his true wants are but industries and dissimulations. For confidence, it is the last, but surest remedy ; namely, to depress and seem to despise whatsoever a man cannot attain, observing the good principle of the merchants, who endeavoured to raise the price of their own commodities and to beat down the price of others. But there is a confidence that passeth this other, which is, to face out a man’s

own defects, in seeming to conceive that he is best in those things wherein he is failing ; and, to help that again, to seem on the other side that he hath least opinion of himself in those things wherein he is best ; like as we shall see it commonly in poets, that if they show their verses, and you except to any, they will say, " that that line cost them more labour than any of the rest ; " and presently will seem to disable and suspect rather some other line, which they know well enough to be the best in the number. But above all, in this righting and helping of a man's self in his own carriage, he must take heed he show not himself dismantled, and exposed to scorn and injury, by too much dulceness, goodness, and facility of nature, but show some sparkles of liberty, spirit, and edge : which kind of fortified carriage, with a ready rescuing of a man's self from scorns, is sometimes of necessity imposed upon men by somewhat in their person or fortune, but it ever succeedeth with good felicity.

Another precept of this knowledge is, by all possible endeavour to frame the mind to be pliant and obedient to occasion ; for nothing hindereth men's fortunes so much as this : " *Idem manebat, neque idem decebat.*" Men are where they were, when occasions turn ; and therefore to Cato, whom Livy maketh such an architect of fortune, he addeth, that he had *versatile ingenium*. And thereof it cometh, that these grave solemn wits, which must be like themselves, and cannot make departures, have more dignity than felicity. But in some it is nature to be somewhat viscous and inwrapped, and not easy to turn. In some it is a conceit, that is almost a nature, which is, that men can hardly make themselves believe that they ought to change their course, when they have found good by it in former experience ; for Machiavel noteth wisely, how Fabius Maximus would have been temporizing still, according to his old bias, when the nature of the war was altered, and required hot pursuit. In some other it is want of point and penetration in their judgment, that they do not discern when things have a period, but come in too late after the occasion ; as Demosthenes compareth the people of Athens to country fellows, when they play in a fence school, that if they have a blow, then they remove their weapon to that ward, and not before. In some other it is a loathness to lose labours passed, and a conceit that they can bring about occasions to their ply ; and yet in the end, when they see no other remedy, then they come to it with disadvantage ; as Tarquinius, that gave for the third part of Sibylla's books the treble price, when he might at first have had all three for the simple. But from whatsoever root or cause this restiveness of mind proceedeth, it is a thing most prejudicial, and nothing is more politic than to make the wheels of our mind concentric and voluble with the wheels of fortune.

Another precept of this knowledge, which hath some affinity with that we last spake of, but with difference, is that which is well expressed " *fatis accede deisque,*" that men do not only turn with the occasions, but also run with the occasions, and not strain their credit or strength to over-hard or extreme points ; but choose in their action that which is most passable : for this will preserve men from foil, and not occupy

them too much about one matter, win opinion of moderation, please the most, and make a show of perpetual felicity in all they undertake ; which cannot but mightily increase reputation.

Another part of this knowledge seemeth to have some repugnancy with the former two, but not as I understand it, and it is that which Demosthenes uttered in high terms : “*Et quemadmodum receptum est, ut exercitum ducat imperator, sic et a cordatis viris res ipsæ ducendæ ; ut quæ ipsis videntur, ea gerantur, et non ipsi eventus tantum persequi cogantur.*” For, if we observe, we shall find two differing kinds of sufficiency in managing of business : some can make use of occasions aptly and dexterously, but plot little : some can urge and pursue their own plots well, but cannot accommodate nor take in ; either of which is very imperfect without the other.

Another part of this knowledge is the observing a good mediocrity in the declaring, or not declaring a man's self : for although depth of secrecy, and making way, “*qualis est via navis in mari,*” which the French calleth “*sourdes menées,*” when men set things in work without opening themselves at all, be sometimes both prosperous and admirable, yet many times “*Dissimulatio errores parit, qui dissimulatorem ipsum illaqueant.*” And therefore, we see, the greatest politicians have in a natural and free manner professed their desires, rather than been reserved and disguised in them : for so we see that Lucius Sylla made a kind of profession, “that he wished all men happy or unhappy, as they stood his friends or enemies.” So Cæsar, when he went first into Gaul, made no scruple to profess, “that he had rather be first in a village, than second at Rome.” So again, as soon as he had begun the war, we see what Cicero saith of him, “*Alter,*” meaning of Cæsar, “*non recusat, sed quodammodo postulat, ut, ut est, sic appelletur, tyrannus.*” So we may see in a letter of Cicero to Atticus, that Augustus Cæsar, in his very entrance into affairs, when he was a darling of the senate, yet in his harangues to the people would swear, “*Ita parentis honores consequi liceat*” (which was no less than the tyranny), save that, to help it, he would stretch forth his hand towards a statue of Cæsar's, that was erected in the same place : and men laughed, and wondered, and said, Is it possible, or, Did you ever hear the like? and yet thought he meant no hurt, he did it so handsomely and ingenuously. And all these were prosperous : whereas Pompey, who tended to the same ends, but in a more dark and dissembling manner, as Tacitus saith of him, “*Occultior, non melior,*” wherein Sallust concurrereth, “*ore probo, animo inverecondo,*” made it his design, by infinite secret engines, to cast the state into an absolute anarchy and confusion, that the state might cast itself into his arms for necessity and protection, and so the sovereign power be put upon him, and he never seen in it : and when he had brought it, as he thought, to that point when he was chosen consul alone, as never any was, yet he could make no great matter of it, because men understood him not ; but was fain in the end to go the beaten track of getting arms into his hands, by colour of the doubt of Cæsar's designs : so tedious, casual, and unfortunate are these deep dissimulations ; whereof, it seemeth, Tacitus made this judgment,

that they were a cunning of an inferior form in regard of true policy, attributing the one to Augustus, the other to Tiberius, where, speaking of Livia, he saith, "*Et cum artibus mariti simulatione filii bene composita* ;" for surely the continual habit of dissimulation is but a weak and sluggish cunning, and not greatly politic.

Another precept of this architecture of fortune is, to accustom our minds to judge of the proportion or value of things, as they conduce and are material to our particular ends ; and that to do substantially and not superficially. For we shall find the logical part, as I may term it, of some men's minds good, but the mathematical part erroneous ; that is, they can well judge of consequences, but not of proportions and comparisons, preferring things of show and sense before things of substance and effect. So some fall in love with access to princes, others with popular fame and applause, supposing they are things of great purchase ; when, in many cases, they are but matters of envy, peril, and impediment.

So some measure things according to the labour and difficulty, or assiduity, which are spent about them ; and think if they be ever moving, that they must needs advance and proceed : as Cæsar saith in a despising manner of Cato the second, when he describeth how laborious and indefatigable he was to no great purpose ; "*Hæc omnia magno studio agebat.*" So in most things men are ready to abuse themselves in thinking the greatest means to be best, when it should be the fittest.

As for the true marshalling of men's pursuits towards their fortune, as they are more or less material, I hold them to stand thus : first, the amendment of their own minds ; for the remove of the impediments of the mind will sooner clear the passages of fortune, than the obtaining fortune will remove the impediments of the mind. In the second place I set down wealth and means, which, I know, most men would have placed first, because of the general use which it beareth towards all variety of occasions. But that opinion I may condemn with like reason as Machiavel doth that other, that moneys were the sinews of the wars, whereas, saith he, the true sinews of the wars are the sinews of men's arms, that is, a valiant, populous, and military nation ; and he voucheth aptly the authority of Solon, who, when Cræsus showed him his treasury of gold, said to him, that if another came that had better iron, he would be master of his gold. In like manner it may be truly affirmed, that it is not moneys that are the sinews of fortune, but it is the sinews and steel of men's minds, wit, courage, audacity, resolution, temper, industry, and the like. In third place I set down reputation, because of the peremptory tides and currents it hath, which, if they be not taken in their due time, are seldom recovered, it being extreme hard to play an after-game of reputation. And lastly I place honour, which is more easily won by any of the other three, much more by all, than any of them can be purchased by honour. To conclude this precept, as there is order and priority in matter, so is there in time, the preposterous placing whereof is one of the commonest errors, while men fly to their ends when they should intend their beginnings ; and do not take things in order of time as they come on, but marshal them

according to greatness, and not according to instance, not observing the good precept, "*Quod nunc instat agamus.*"

Another precept of this knowledge is, not to embrace any matters which do occupy too great a quantity of time, but to have that sounding in a man's ears, "*Sed fugit interea, fugit irreparabile tempus :*" and that is the cause why those which take their course of rising by professions of burden, as lawyers, orators, painful divines, and the like, are not commonly so politic for their own fortunes, otherwise than in their ordinary way, because they want time to learn particulars, to wait occasions, and to devise plots.

Another precept of this knowledge is, to imitate nature, which doth nothing in vain : which surely a man may do if he do well interlace his business, and bend not his mind too much upon that which he principally intendeth. For a man ought in every particular action so to carry the motions of his mind, and so to have one thing under another, as if he cannot have that he seeketh in the best degree, yet to have it in a second, or so in a third ; and if he can have no part of that which he purposed, yet to turn the use of it to somewhat else ; and if he cannot make anything of it for the present, yet to make it as a seed of somewhat in time to come ; and if he can contrive no effect or substance from it, yet to win some good opinion by it, or the like. So that he should exact an account of himself of every action, to reap somewhat, and not to stand amazed and confused if he fail of that he chiefly meant : for nothing is more impolitic than to mind actions wholly one by one ; for he that doth so, loseth infinite occasions which intervene, and are many times more proper and propitious for somewhat that he shall need afterwards, than for that which he urgeth for the present ; and therefore men must be perfect in that rule, "*Hæc oportet facere, et illa non omittere.*"

Another precept of this knowledge is, not to engage a man's self peremptorily in anything, though it seem not liable to accident, but ever to have a window to fly out at, or a way to retire ; following the wisdom in the ancient fable of the two frogs, which consulted when their plash was dry whither they should go, and the one moved to go down into a pit, because it was not likely the water would dry there, but the other answered, "*True, but if it do, how shall we get out again?*"

Another precept of this knowledge is, that ancient precept of Bias, construed not to any point of perfidiousness, but only to caution and moderation, "*Et ama tanquam inimicus futurus, et odi tanquam amaturus :*" for it utterly betrayeth all utility, for men to embark themselves too far into unfortunate friendships, troublesome spleens, and childish and humourous envies or emulations.

But I continue this beyond the measure of an example, led, because I would not have such knowledges, which I note as deficient, to be thought things imaginative, or in the air ; or an observation or two much made of, but things of bulk and mass, whereof an end is hardlier made than a beginning. It must be likewise conceived that in those points which I mention and set down, they are far from complete tractates of them, but only as small pieces for patterns : and lastly,

no man, I suppose, will think that I mean fortunes are not obtained without all this ado ; for I know they come tumbling in some men's laps, and a number obtain good fortunes by diligence in a plain way, little intermeddling, and keeping themselves from gross errors.

But as Cicero, when he setteth down an idea of a perfect orator, doth not mean that every pleader should be such ; and so likewise, when a prince or a courtier hath been described by such as have handled those subjects, the mould hath used to be made according to the perfection of the art, and not according to common practice : so I understand it, that it ought to be done in the description of a politic man, I mean politic for his own fortune.

But it must be remembered all this while, that the precepts which we have set down are of that kind which may be counted and called *bonæ artes*. As for evil arts, if a man would set down for himself that principle of Machiavel, "that a man seek not to attain virtue itself, but the appearance only thereof ; because the credit of virtue is a help, but the use of it is cumber :" or that other of his principles, "that he presuppose that men are not fitly to be wrought otherwise but by fear, and therefore that he seek to have every man obnoxious, low, and in strait," which the Italians call "seminar spine," to sow thorns : or that other principle contained in the verse which Cicero citeth, "*Cadant amici, dummodo inimici intercidant*," as the Triumvirs, which sold, every one to other, the lives of their friends, for the deaths of their enemies : or that other protestation of L. Catilina, to set on fire, and trouble states, to the end to fish in droumy waters, and to unwrap their fortunes, "*Ego si quid in fortunis meis excitatum sit incendium, id non aqua, sed ruina restinguam*:" or that other principle of Lysander, "that children are to be deceived with comfits, and men with oaths :" and the like evil and corrupt positions, whereof, as in all things, there are more in number than of the good : certainly, with these dispensations from the laws of charity and integrity, the pressing of a man's fortune may be more hasty and compendious. But it is in life as it is in ways, the shortest way is commonly the foulest, and surely the fairer way is not much about.

But men, if they be in their own power, and do bear and sustain themselves, and be not carried away with a whirlwind or tempest of ambition, ought, in the pursuit of their own fortune, to set before their eyes, not only that general map of the world, that "all things are vanity and vexation of spirit," but many other more particular cards and directions : chiefly that, that being, without well-being, is a curse, and the greater being the greater curse ; and that all virtue is most rewarded, and all wickedness most punished in itself : according as the poet saith excellently :

Quæ vobis, quæ digna, viri, pro laudibus istis
Præmia posse rear solvi ? pulcherrima primum
Dii moresque dabunt vestri.

And so of the contrary. And, secondly, they ought to look up to the eternal providence and divine judgment, which often subverteth the wisdom of evil plots and imaginations, according to that Scripture.

"He hath conceived mischief, and shall bring forth a vain thing." And although men should refrain themselves from injury and evil arts, yet this incessant and sabbathless pursuit of a man's fortune leaveth not that tribute which we owe to God of our time: who, we see, demandeth a tenth of our substance, and a seventh, which is more strict, of our time: and it is to small purpose to have an erected face towards heaven, and a perpetual grovelling spirit upon earth, eating dust, as doth the serpent, "*Atque affigit humo divinæ particulam auræ.*" And if any man flatter himself that he will employ his fortune well, though he should obtain it ill, as was said concerning Augustus Cæsar, and after of Septimus Severus, "that either they should never have been born, or else they should never have died," they did so much mischief in the pursuit and ascent of their greatness, and so much good when they were established: yet these compensations and satisfactions are good to be used, but never good to be purposed. And, lastly, it is not amiss for men in their race towards their fortune, to cool themselves a little with that conceit which is elegantly expressed by the emperor Charles the fifth, in his instructions to the king his son, "that fortune hath somewhat of the nature of a woman, that if she be too much wooed, she is the farther off." But this last is but a remedy for those whose tastes are corrupted: let men rather build upon that foundation which is as a corner-stone of divinity and philosophy, wherein they join close, namely, that same *Primum querite*. For divinity saith, "*Primum querite regnum Dei, et ista omnia adjiciuntur vobis:*" and philosophy saith, "*Primum querite bonam animi cætera aut aderunt, aut non oberunt.*" And although the human foundation hath somewhat of the sands, as we see in M. Brutus, when he brake forth into that speech,

Te colui, virtus, ut rem: ast tu nomen inane es:

yet the divine foundation is upon the rock. But this may serve for a taste of that knowledge which I noted as deficient.

Concerning government, it is a part of knowledge, secret and retired in both these respects, in which things are deemed secret; for some things are secret because they are hard to know, and some because they are not fit to utter; we see all governments are obscure and invisible.

Totamque infusa per artus
Mens agitat molem, et magno se corpore miscet.

Such is the description of governments: we see the government of God over the world is hidden, inasmuch as it seemeth to participate of much irregularity and confusion: the government of the soul in moving the body is inward and profound, and the passages thereof hardly to be reduced to demonstration. Again, the wisdom of antiquity, the shadows whereof are in the poets, in the description of torments and pains, next unto the crime of rebellior, which was the giants' offence, doth detest the crime of futility, as in Sisyphus and Tantalus. But this was meant of particulars; nevertheless, even unto the general

rules and discourses of policy and government there is due a reverent and reserved handling.

But, contrariwise, in the governors towards the governed, all things ought, as far as the frailty of man permitteth, to be manifest and revealed. For so it is expressed in the Scriptures touching the government of God, that this globe which seemeth to us a dark and shady body, is in the view of God as crystal, "*Et in conspectu sedis tanquam mare vitreum simile crystallo.*" So unto princes and states, specially towards wise senates and councils, the natures and dispositions of the people, their conditions and necessities, their factions and combinations, their animosities and discontents, ought to be, in regard of the variety of their intelligences, the wisdom of their observations, and the height of the station where they kept centinel, in great part clear and transparent. Wherefore, considering that I write to a king that is a master of this science, and is so well assisted, I think it decent to pass over this part in silence, as willing to obtain the certificate which one of the ancient philosophers aspired unto; who being silent, when others contended to make demonstration of their abilities by speech, desired it might be certified for his part, "that there was one that knew how to "hold his peace."

Notwithstanding, for the more public part of government, which is laws, I think good to note only one deficiency: which is, that all those which have written of laws, have written either as philosophers, or as lawyers, and none as statesmen. As for the philosophers, they make imaginary laws for imaginary commonwealths, and their discourses are as the stars, which give little light, because they are so high. For the lawyers, they write according to the states where they live, what is received law, and not what ought to be law; for the wisdom of a law-maker is one, and of a lawyer is another. For there are in nature certain fountains of justice, whence all civil laws are derived but as streams: and like as waters do take tinctures and tastes from the soils through which they run, so do civil laws vary according to the regions and governments where they are planted, though they proceed from the same fountains. Again, the wisdom of a law-maker consisteth not only in a platform of justice, but in the application thereof; taking into consideration by what means laws may be made certain, and what are the causes and remedies of the doubtfulness and uncertainty of law; by what means law may be made apt and easy to be executed, and what are the impediments and remedies in the execution of laws; what influence laws touching private right of *meum* and *tuum* have into the public state, and how they may be made apt and agreeable; how laws are to be penned and delivered, whether in texts or in acts, brief or large, with preambles or without; how they are to be pruned and reformed from time to time, and what is the best means to keep them from being too vast in volumes, or too full of multiplicity or crossness: how they are to be expounded, when upon causes emergent, and judiciously discussed: and when upon responses and conferences touching general points or questions; how they are to be pressed, rigorously or tenderly; how they are to be mitigated by equity and

good conscience, and whether discretion and strict law are to be mingled in the same courts, or kept apart in several courts; again, how the practice, profession, and erudition of law is to be censured and governed; and many other points touching the administration, and, as I may term it, animation of laws. Upon which I insist the less, because I propose, if God give me leave, having begun a work of this nature, in aphorisms, to propound it hereafter, noting it in the mean time for deficient.

And for your majesty's laws of England, I could say much of their dignity, and somewhat of their defect; but they cannot but excel the civil laws in fitness for the government: for the civil law was, "*Non hos quæsitum munus in usus;*" it was not made for the countries which it governeth: hereof I cease to speak, because I will not intermingle matter of action with matter of general learning.

THUS have I concluded this portion of learning touching civil knowledge, and with civil knowledge have concluded human philosophy; and with human philosophy, philosophy in general; and being now at some pause, looking back into that I have passed through, this writing seemeth to me, *si nunquam fallit imago*, as far as a man can judge of his own work, not much better than that noise or sound which musicians make while they are in tuning their instruments, which is nothing pleasant to hear, but yet is a cause why the music is sweeter afterwards. So have I been content to tune the instrument of the Muses, that they may play that have better hands. And surely, when I set before me the condition of these times, in which learning hath made her third visitation or circuit in all the qualities thereof; as the excellency and vivacity of the wits of this age; the noble helps and lights which we have by the travels of ancient writers; the art of printing, which communicateth books to men of all fortunes: the openness of the world by navigation, which hath disclosed multitudes of experiments, and a mass of natural history; the leisure wherewith these times abound, not employing men so generally in civil business, as the states of Græcia did, in respect of their popularity and the state of Rome in respect of the greatness of their monarchy; the present disposition of these times at this instant to peace; the consumption of all that ever can be said in controversies of religion, which have so much diverted men from other sciences; the perfection of your majesty's learning, which as a phoenix may call whole vollics of wits to follow you; and the inseparable propriety of time which is ever more and more to disclose truth; I cannot but be raised to this persuasion, that this third period of time will far surpass that of the Græcian and Roman learning: only if men will know their own strength, and their own weakness both; and take, one from the other, light of invention, and not fire of contradiction; and esteem of the inquisition of truth, as of an enterprise, and not as of a quality or ornament; and employ wit and magnificence to things of worth and excellency, and not to things vulgar and of popular estimation. As for my labours, if any man

should please himself, or others, in the reprehension of them, they shall make that ancient and patient request, "*Verbera, sed audi.*" Let men reprehend them, so they observe and weigh them. For the appeal is lawful, though it may be it shall not be needful, from the first cogitations of men to their second, and from the nearer times to the times farther off. Now let us come to that learning, which both the former times were not so blessed as to know, sacred and inspired Divinity, the sabbath and port of all men's labours and peregrinations.

THE prerogative of God extendeth as well to the reason, as to the will of man ; so that as we are to obey his law, though we find a reluctance in our will ; so we are to believe his word, though we find a reluctance in our reason. For if we believe only that which is agreeable to our sense, we give consent to the matter, and not to the author, which is no more than we would do towards a suspected and discredited witness : but that faith which was "accounted to Abraham for righteousness," was of such a point, as whereat Sarah laughed, who therein was an image of natural reason.

Howbeit, if we will truly consider it, more worthy it is to believe than to know as we now know. For in knowledge man's mind suffereth from sense, but in belief it suffereth from spirit, such one as it holdeth for more authorized than itself ; and so suffereth from the worthier agent. Otherwise it is of the state of man glorified, for then faith shall cease, and "we shall know as we are known."

Wherefore we conclude, that sacred theology, which in our idiom we call divinity, is grounded only upon the word and oracle of God, and not upon the light of nature : for it is written, "*Cœli enarrant gloriam Dei :*" but it is not written, "*Cœli enarrant voluntatem Dei :*" but of that it is said, "*Ad legem et testimonium, si non fecerint secundum verbum istud,*" etc. This holdeth not only in those points of faith which concern the great mysteries of the Deity, of the creation, of the redemption, but likewise those which concern the law moral truly interpreted ; "Love your enemies : do good to them that hate you : be like to your heavenly Father, that suffereth his rain to fall upon the just and unjust." To this it ought to be applauded, "*Nec vox hominem sonat,*" it is a voice beyond the light of nature. So we see the heathen poets, when they fall upon a libertine passion, do still expostulate with laws and moralities, as if they were opposite and malignant to nature ; "*Et quod natura remittit Invida jura negant.*" So said Dendamis the Indian unto Alexander's messengers ; "that he had heard somewhat of Pythagoras, and some other of the wise men of Græcia, and that he held them for excellent men : but that they had a fault, which was, that they had in too great reverence and veneration a thing they called law and manners." So it must be confessed that a great part of the law moral is of that perfection, whereunto the light of nature cannot aspire ; how then is it, that man is said to have, by the light and law of nature, some notions and conceits of virtue and vice, justice and wrong, good and evil ? Thus : because the light of nature is used in two several senses ; the one, that which springeth from

reason, sense, induction, argument, according to the laws of heaven and earth ; the other, that which is imprinted upon the spirit of man by an inward instinct, according to the law of conscience, which is a sparkle of the purity of his first estate : in which latter sense only he is participant, of some light and discerning touching the perfection of the moral law : but how ? Sufficient to check the vice, but not to inform the duty. So then the doctrine of religion, as well moral as mystical, is not to be attained, but by inspiration and revelation from God.

The use, notwithstanding, of reason, in spiritual things, and the latitude thereof, is very great and general ; for it is not for nothing that the apostle calleth religion our *reasonable service* of God, insomuch as the very ceremonies and figures of the old law were full of reason and signification, much more than the ceremonies of idolatry and magic, that are full of non-significants and surd characters. But most especially the Christian faith, as in all things, so in this, deserveth to be highly magnified, holding and preserving the golden mediocrity in this point, between the law of the heathen, and the law of Mahomet, which have embraced the two extremes. For the religion of the heathen had no constant belief or confession, but left all to the liberty of argument : and the religion of Mahomet, on the other side, interdicteth argument altogether : the one having the very face of error, and the other of imposture ; whereas the faith doth both admit and reject disputation with difference.

The use of human reason in religion is of two sorts : the former, in the conception and apprehension of the mysteries of God to us revealed ; the other, in the inferring and deriving of doctrine and direction thereupon. The former extendeth to the mysteries themselves ; but how ? By way of illustration, and not by way of argument. The latter consisteth indeed of probation and argument. In the former, we see, God vouchsafeth to descend to our capacity, in the expressing of his mysteries in sort as may be sensible unto us ; and doth graft his revelations and holy doctrine upon the notions of our reason, and applieth his inspirations to open our understanding, as the form of the key to the ward of the lock. For the latter there is allowed us an use of reason and argument, secondary and respective, although not original and absolute. For after the articles and principles of religion are placed and exempted from examination of reason, it is then permitted unto us to make derivations and inferences from, and according to the analogy of them, for our better direction. In nature this holdeth not, for both the principles are examinable by induction, though not by a medium or syllogism ; and besides, those principles or first positions have no discordance with that reason, which draweth down and deduceth the inferior positions. But yet it holdeth not in religion alone, but in many knowledges, both of greater and smaller nature, namely, wherein there are not only *posita* but *placita* ; for in such there can be no use of absolute reason : we see it familiarly in games of wit, as chess, or the like ; the draughts and first laws of the game are positive, but how ? merely *ad placitum*, and not examinable by reason : but then how to direct our play thereupon with best

advantage to win the game, is artificial and rational. So in human laws, there be many grounds and maxims, which are *placita juris*, positive upon authority and not upon reason, and therefore not to be disputed: but what is most just, not absolutely, but relatively and according to those maxims, that affordeth a long field of disputation. Such therefore is that secondary reason, which hath place in divinity, which is grounded upon the *placets* of God.

Here therefore I note this deficiency, that there hath not been, to my understanding, sufficiently inquired and handled the true limits and use of reason in spiritual things, as a kind of divine dialectic: which for that it is not done, it seemeth to me a thing usual, by pretext of true conceiving that which is revealed, to search and mine into that which is not revealed, and, by pretext of enucleating inferences and contradictories, to examine that which is positive: the one sort falling into the error of Nicodemus, demanding to have things made more sensible than it pleaseth God to reveal them, "*Quomodo possit homo nasci cum sit senex?*" the other sort into the error of the disciples, which were scandalized at a show of contradiction, "*Quid est hoc, quod dicit nobis? Modicum et non videbitis me, et iterum modicum, et videbitis me,*" etc.

Upon this I have insisted the more, in regard of the great and blessed use thereof; for this point, well laboured and defined of, would, in my judgment, be an opiate to stay and bridle not only the vanity of curious speculations, wherewith the schools labour, but the fury of controversies, wherewith the Church laboureth. For it cannot but open men's eyes, to see that many controversies do merely pertain to that which is either not revealed, or positive, and that many others do grow upon weak and obscure inferences or derivations; which latter sort, if men would revive the blessed stile of that great doctor of the Gentiles, would be carried thus; *Ego, non Dominus*; and again, *Secundum consilium meum*; in opinions and counsels, and not in positions and oppositions. But men are now over-ready to usurp the stile, *Non ego, sed Dominus*; and not so only, but to bind it with the thunder and denunciation of curses and anathemas, to the terror of those which have not sufficiently learned out of Solomon, that "the causeless curse shall not come."

Divinity hath two principal parts; the matter informed or revealed, and the nature of the information or revelation: and with the latter we will begin, because it hath most coherence with that which we have now last handled. The nature of the information consisteth of three branches; the limits of the information, the sufficiency of the information, and the acquiring or obtaining the information. Unto the limits of the information belong these considerations; how far forth particular persons continue to be inspired; how far forth the Church is inspired; and how far forth reason may be used: the last point whereof I have denoted as deficient. Unto the sufficiency of the information belong two considerations; what points of religion are fundamental, and what perfective, being matter of farther building and perfection upon one and the same foundation; and again, how the gradations of light,

according to the dispensation of times, are material to the sufficiency of belief.

Here again I may rather give it in advice, than note it as deficient, that the points fundamental, and the points of farther perfection, only ought to be with piety and wisdom distinguished ; a subject tending to much like end, as that I noted before ; for as that other were likely to abate the number of controversies, so this is like to abate the heat of many of them. We see Moses when he saw the Israelite and the *Ægyptian* fight, he did not say, "Why strive you?" but drew his sword, and slew the *Ægyptian* : but when he saw the two Israelites fight, he said, "You are brethren, why strive you?" If the point of doctrine be an *Ægyptian*, it must be slain by "the sword of the Spirit," and not reconciled : but if it be an Israelite, though in the wrong, then, "Why strive you?" We see of the fundamental points, our Saviour penneth the league thus ; "He that is not with us, is against us ;" but of points not fundamental, thus ; "He that is not against us, is with us." So we see the coat of our Saviour was entire without seam, and so is the doctrine of the Scriptures in itself ; but the garment of the Church was of divers colours, and yet not divided : we see the chaff may and ought to be severed from the corn in the ear, but the tares may not be pulled up from the corn in the field. So as it is a thing of great use well to define, what, and of what latitude those points are, which do make men merely aliens and disincorporate from the Church of God.

For the obtaining of the information, it resteth upon the true and sound interpretation of the Scriptures, which are the fountains of the water of life. The interpretations of the Scriptures are of two sorts : methodical, and solute or at large. For this divine water, which excelleth so much that of Jacob's well, is drawn forth much in the same kind, as natural water useth to be out of wells and fountains ; either it is first forced up into a cistern, and from thence fetched and derived for use ; or else it is drawn and received into buckets and vessels immediately where it springeth. The former sort whereof, though it seem to be the more ready, yet, in my judgment, is more subject to corrupt. This is that method which hath exhibited unto us the scholastical divinity, whereby divinity hath been reduced into an art as into a cistern, and the streams of doctrine or positions fetched and derived from thence.

In this men have sought three things, a summary brevity, a compacted strength, and a complete perfection ; whereof the two first they fail to find, and the last they ought not to seek. For as to brevity, we see, in all summary methods, while men purpose to abridge, they give cause to dilate. For the sum, or abridgment, by contraction becometh obscure : the obscurity requireth exposition, and the exposition is deduced into large commentaries, or into common places and titles, which grow to be more vast than the original writings, whence the sum was at first extracted. So, we see, the volumes of the schoolmen are greater much than the first writings of the fathers, whence the master of the sentences made his sum or collection. So, in like manner, the volumes of the modern doctors of the civil law exceed those of the

ancient jurisconsults, of which Trebonian compiled the digest. So as this course of sums and commentaries is that which doth infallibly make the body of sciences more immense in quantity, and more base in substance.

And for strength, it is true, that knowledges reduced into exact methods have a show of strength, in that each part seemeth to support and sustain the other; but this is more satisfactory than substantial: like unto buildings which stand by architecture and compaction, which are more subject to ruin, than those that are built more strong in their several parts, though less compacted. But it is plain, that the more you recede from your grounds, the weaker do you conclude and as in nature, the more you remove yourself from particulars, the greater peril of error you do incur; so much more in divinity, the more you recede from the Scriptures, by inferences and consequences, the more weak and dilute are your positions.

And as for perfection, or completeness in divinity, it is not to be sought; which makes this course of artificial divinity the more suspect. For he that will reduce a knowledge into an art, will make it round and uniform: but, in divinity, many things must be left abrupt and concluded with this: "*O altitudo sapientiae et scientiae Dei! quam incomprehensibilia sunt judicia ejus, et non investigabiles viæ ejus?*" So again the apostle saith, "*Ex parte scimus;*" and to have the form of a total, where there is but matter for a part, cannot be without supplies by supposition and presumption. And therefore I conclude, that the true use of these sums and methods hath place in institutions or introductions preparatory unto knowledge; but in them, or by deducement from them, to handle the main body and substance of a knowledge, is in all sciences prejudicial, and in divinity dangerous.

As to the interpretation of the Scriptures solute and at large, there have been divers kinds introduced and devised; some of them rather curious and unsafe, than sober and warranted. Notwithstanding, thus much must be confessed, that the Scriptures being given by inspiration, and not by human reason, do differ from all other books in the author; which by consequence doth draw on some difference to be used by the expositor. For the inditer of them did know four things which no man attains to know; which are, the mysteries of the kingdom of glory, the perfection of the laws of nature, the secrets of the heart of man, and the future succession of all ages. For as to the first it is said, "He that presseth into the light, shall be oppressed of the glory." And again, "No man shall see my face and live." To the second, "When he prepared the heavens I was present, when by law and compass he enclosed the deep." To the third, "Neither was it needful that any should bear witness to him of man, for he knew well what was in man." And to the last, "From the beginning are known to the Lord all his works."

From the former of these two have been drawn certain senses and expositions of Scriptures, which had need be contained within the bounds of sobriety; the one anagogical, and the other philosophical. But as to the former, man is not to prevent his time, "*Videmus nunc*

per speculum in ænigmate, tunc autem facie ad faciem;" wherein, nevertheless, there seemeth to be a liberty granted, as far forth as the polishing of this glass, or some moderate explication of this enigma. But to press too far into it, cannot but cause a dissolution and overthrow of the spirit of man: for in the body there are three degrees of that we receive into it, ailment, medicine, and poison; whereof ailment is that which the nature of man can perfectly alter and overcome; medicine is that which is partly converted by nature, and partly converteth nature; and poison is that which worketh wholly upon nature, without that, that nature can in any part work upon it: so in the mind, whatsoever knowledge reason cannot at all work upon and convert, is a mere intoxication, and indangereth a dissolution of the mind and understanding.

But for the latter, it hath been extremely set on foot of late time by the school of Paracelsus, and some others, that have pretended to find the truth of all natural philosophy in the Scriptures; scandalizing and traducing all other philosophy as heathenish and profane. But there is no such enmity between God's word and his works; neither do they give honour to the Scriptures, as they suppose, but much embase them. For to seek heaven and earth in the word of God, whereof it is said, "heaven and earth shall pass, but my word shall not pass," is to seek temporary things amongst eternal; and as to seek divinity in philosophy, is to seek the living amongst the dead; so to seek philosophy in divinity, is to seek the dead amongst the living; neither are the pots or lavers, whose place was in the outward part of the temple, to be sought in the holiest place of all, where the ark of the testimony was seated. And again the scope or purpose of the Spirit of God is not to express matters of nature in the Scriptures, otherwise than in passage, and for application to man's capacity, and to matters moral or divine. And it is a true rule, "*Auctoris aliud agentis parva auctoritas:*" for it were a strange conclusion, if a man should use a similitude for ornament or illustration sake, borrowed from nature or history, according to vulgar conceit, as of a basilisk, an unicorn, a centaur, a Briareus, a Hydra, or the like, that therefore he must needs be thought to affirm the matter thereof positively to be true. To conclude therefore these two interpretations, the one by reduction or enigmatical, the other philosophical or physical, which have been received and pursued in imitation of the rabbins and cabalists, are to be confined with a "*noli altum sapere, sed time.*"

But the two latter points, known to God, and unknown to man, touching the secrets of the heart, and the successions of time, do make a just and sound difference between the manner of the exposition of the Scriptures and all other books. For it is an excellent observation which hath been made upon the answers of our Saviour Christ to many of the questions which were propounded to him, how that they are impertinent to the state of the question demanded; the reason whereof is, because not being like man, which knows man's thoughts by his words, but knowing man's thoughts immediately, he never answered their words but their thoughts: much in the like manner it

is with the Scriptures, which being written to the thoughts of men, and to the succession of all ages, with a foresight of all heresies, contradictions, differing estates of the Church, yea, and particularly of the elect, are not to be interpreted only according to the latitude of the proper sense of the place, and respectively towards that present occasion, whereupon the words were uttered, or in precise congruity, or contexture with the words before or after, or in contemplation of the principal scope of the place ; but have in themselves, not only totally or collectively, but distributively in clauses and words, infinite springs and streams of doctrine to water the Church in every part : and therefore as the literal sense is, as it were, the main stream or river, so the moral sense chiefly, and sometimes the allegorical or typical, are they whereof the Church hath most use : not that I wish men to be bold in allegories, or indulgent or light in allusions ; but that I do much condemn that interpretation of the Scripture, which is only after the manner as men use to interpret a profane book.

In this part, touching the exposition of the Scriptures, I can report no deficiency ; but by way of remembrance, this I will add, in perusing books of divinity, I find many books of controversies, and many of common places, and treatises, a mass of positive divinity, as it is made an art ; a number of sermons and lectures, and many prolix commentaries upon the Scriptures, with harmonies and concordances : but that form of writing in divinity, which in my judgment is of all others most rich and precious, is positive divinity, collected upon particular texts of Scriptures in brief observations, not dilated into common places ; not chasing after controversies ; not reduced into method of art ; a thing abounding in sermons, which will vanish, but defective in books which will remain, and a thing wherein this age excelleth. For I am persuaded, and I may speak it, with an "*Absit invidia verbo*," and no ways in derogation of antiquity, but as in a good emulation between the vine and the olive, that if the choice and best of those observations upon texts of Scriptures, which have been made dispersedly in sermons within your majesty's island of Britain, by the space of these forty years and more, leaving out the largeness of exhortations and applications thereupon, had been set down in a continuance, it had been the best work in divinity, which had been written since the apostles' times.

The matter informed by divinity is of two kinds : matter of belief, and truth of opinion ; and matter of service and adoration ; which is also judged and directed by the former ; the one being as the internal soul of religion, and the other as the external body thereof. And therefore the heathen religion was not only a worship of idols, but the whole religion was an idol in itself, for it had no soul ; that is, no certainty of belief or confession ; as a man may well think, considering the chief doctors of their church were the poets : and the reason was, because the heathen gods were no jealous gods, but were glad to be admitted into part, as they had reason. Neither did they respect the pureness of heart, so they might have external honour and rites.

But out of these two do result and issue four main branches of

divinity : Faith, Manners, Liturgy, and Government. Faith containeth the doctrine of the nature of God, of the attributes of God, and of the works of God. The nature of God consisteth of three persons in unity of Godhead. The attributes of God are either common to the Deity, or respective to the persons. The works of God summary are two, that of the creation, and that of the redemption ; and both these works, as in total they appertain to the unity of the Godhead, so in their parts they refer to the three persons : that of the creation, in the mass of the matter, to the Father ; in the disposition of the form, to the Son ; and in the continuance and conversation of the being, to the Holy Spirit ; so that of the redemption, in the election and counsel, to the Father ; in the whole act and consummation, to the Son ; and in the application, to the Holy Spirit : for by the Holy Ghost was Christ conceived in flesh, and by the Holy Ghost are the elect regenerate in spirit. This work likewise we consider either effectually, in the elect ; or privately, in the reprobate ; or according to appearance, in the visible Church.

For manners, the doctrine thereof is contained in the law, which discloseth sin. The law itself is divided, according to the edition thereof, into the law of nature, the law moral, and the law positive ; and, according to the stile, into negative and affirmative, prohibitions and commandments. Sin, in the matter and subject thereof, is divided according to the commandments ; in the form thereof, it referreth to the three persons in Deity. Sins of infirmity against the Father, whose more special attribute is power ; sins of ignorance against the Son, whose attribute is wisdom ; and sins of malice against the Holy Ghost, whose attribute is grace or love. In the motions of it, it either moveth to the right hand or to the left, either to blind devotion, or to profane and libertine transgression ; either in imposing restraint where God granteth liberty, or in taking liberty where God imposeth restraint. In the degrees and progress of it, it divideth itself into thought, word, or act. And in this part I commend much the deducing of the law of God to cases of conscience, for that I take indeed to be a breaking, and not exhibiting whole, of the bread of life. But that which quickeneth both these doctrines of faith and manners, is the elevation and consent of the heart ; whereunto appertain books of exhortation, holy meditation, Christian resolution, and the like.

For the liturgy or service, it consisteth of the reciprocal acts between God and man : which, on the part of God, are the preaching of the word, and the sacraments, which are seals to the covenant, or as the visible word ; and on the part of man, invocation of the name of God ; and, under the law, sacrifices ; which were as visible prayers or confessions ; but now the adoration being *in spiritu et veritate*, there remaineth only *vituli laborum*, although the use of holy vows of thankfulness and retribution may be accounted also as sealed petitions.

And for the government of the Church, it consisteth of the patrimony of the Church, the franchises of the Church, and the offices and jurisdictions of the Church, and the laws of the Church directing the whole ; all which have two considerations, the one in themselves, the other how they stand compatible and agreeable to the civil estate.

This matter of divinity is handled either in form of instruction of truth, or in form of confutation of falsehood. The declinations from religion, besides the privative, which is atheism, and the branches thereof, are three; heresies, idolatry, and witchcraft: heresies, when we serve the true God with a false worship; idolatry, when we worship false gods, supposing them to be true; and witchcraft, when we adore false gods, knowing them to be wicked and false. For so your majesty doth excellently well observe, that witchcraft is the height of idolatry. And yet we see though these be true degrees, Samuel teacheth us that they are all of a nature, when there is once a receding from the word of God; for so he saith, "Quasi peccatum ariolandi est repugnare, et quasi scelus idololatriæ nolle acquiescere."

These things I have passed over so briefly, because I can report no deficiency concerning them: for I can find no space or ground that lieth vacant and unsown in the matter of divinity; so diligent have been men, either in sowing of good seed, or in sowing of tares.

THUS have I made, as it were, a small globe of the intellectual world, as truly and faithfully as I could discover, with a note and description of those parts which seem to me not constantly occupate, or not well converted by the labour of man. In which, if I have in any point receded from that which is commonly received, it hath been with a purpose of proceeding *in melius*, and not *in aliud*: a mind of amendment and proficience, and not of change and difference. For I could not be true and constant to the argument I handle, if I were not willing to go beyond others, but yet not more willing than to have others go beyond me again; which may the better appear by this, that I have propounded my opinions naked and unarmed, not seeking to pre-occupate the liberty of men's judgments by confutations. For in any thing which is well set down, I am in good hope, that if the first reading move an objection, the second reading will make an answer. And in those things wherein I have erred, I am sure, I have not prejudiced the right by litigious arguments, which certainly have this contrary effect and operation, that they add authority to error, and destroy the authority of that which is well invented. For question is an honour and preferment to falsehood, as on the other side it is a repulse to truth. But the errors I claim and challenge to myself as my own. The good, if any be, is due *tanquam adeps sacrificii*, to be incensed to the honour first of the Divine Majesty, and next of your majesty, to whom on earth I am most bounden.



NOVUM ORGANUM;

OR, TRUE DIRECTIONS FOR THE INTER- PRETATION OF NATURE.



PREFACE.

THOSE who have presumed to dogmatize on Nature as on a well-explored subject, whether they have done so from self-confidence or affectedly and in a professorial manner, have done very great harm to Philosophy and the Sciences. For, so far as they have succeeded in gaining credit, they have been instrumental in stifling and breaking off inquiry : and the services which they have rendered have been outweighed by the injury they have done in corrupting and destroying those of others. And those who have proceeded in the opposite course, and have declared that nothing at all can be known, whether they have fallen into this opinion from a dislike to the ancient Sophists, or from want of decision, or even from a sort of overabundance of learning, have certainly adduced reasons for it which are not to be despised : yet they have not drawn their conclusion from true beginnings ; but, carried forward by a kind of earnestness and affectation, have overstepped all bounds. But the older Greeks (whose writings have perished) have steered more prudently between the arrogance of dogmatizing and the despair of Acatalepsy : and while they vented complaints and expressions of indignation at the difficulty of inquiry and the obscurity of things, and, so to speak, champed the bit, still did not fail to press their point and to grapple with Nature ; thinking it better, as it seemed, not to dispute the question (whether anything can be known), but to leave it to experiment. Even they, however, used only the bare force of intellect, unguided by any fixed rule, and put all their trust in intense meditation of continual action and exercise of the mind.

But our plan is as easy to describe as it is difficult to put in practice. For it consists in laying down degrees of certainty, in guarding the sense from error by a process of correction, while we reject for the most part that operation of the mind which follows close upon the sense ; and then in opening and constructing a new and certain way for the mind from the very perceptions of the senses. And this was, doubtless, also recognized by those who assigned such important

functions to Logic ; whereby it is clear that they sought to support the intellect while they distrusted the native and spontaneous onward action of the mind. But this remedy is clearly too late in its application, when the cause is hopeless ; the mind, through the daily habit of life, having become occupied by depraved conversation and teaching, and beset by the emptiest *idola*. And so that art of Logic, taking its precautions when, as we said, it was too late, failed entirely in restoring the matter to order, and rather served to render error permanent than to open out the truth. There remains only one way of safe and healthy action ; it is that the whole work of the mind should be recommenced anew ; that the mind, from the very beginning, be in nowise left to itself, but be kept under continual restraint ; and that the matter should be carried out as if by machinery. Certainly, if men set about works requiring mechanical aids with their bare hands, and without the power and assistance of instruments, as they have not hesitated to treat works intellectual with the almost unassisted powers of the mind, very small would have been the things which they could have set in motion and overcome, even though they had strained and combined their powers to the utmost. And suppose that we pause awhile, and look into this same illustration as into a mirror : let us imagine (if you please) that some obelisk, famous for its size, had to be removed to do grace to a triumph or some such pageant, and that men were to attempt the removal with their bare hands, would not any sober looker on admit that it was an act of downright madness ? And if they were to increase the number of workmen, hoping thus to succeed, would he not say it was much more so ? But if they thought proper to make a selection, and were to set aside the weaker, and employ only the strong and vigorous, and to hope that thus, at least, they might gain their wish, would he not say that they were more extravagantly beside themselves ? And further, if, not content with this, they should resolve to call in the aid of the athletic art, and should bid all their workmen appear henceforward with their hands, arms, and muscles well oiled and doctored according to rule, would he not exclaim that they were taking pains to be mad with a kind of method and foresight ? And yet men are carried on by a like unsound energy and useless combination in matters relating to the intellect, so long as they look for great results either from the number and union of natural abilities or from their excellence and acuteness, or even so long as they strengthen the muscles of the mind of Logic (which may almost be called the athletics of the mind) ; but, in the meantime, although they throw so much zeal and effort into the work, cease not (if one looks at the matter fairly) to apply the intellect *bare*. But it is most clear that in every great work, which is undertaken by the hand of man, neither can the strength of individuals be intensified, or that of the many united, without the aid of instruments and machinery.

And so, from the foregoing premises, we lay down two points of which we would have men clearly advised, lest, perchance, they should scape or slip by them. And the first is this. It happens, by the kindness of Fate, (as we think), with a view to the extinction and

banishment of controversies and heartburnings, that the honour and reverence paid to the ancients remain untouched and undiminished, while we are able to carry out our appointed task and still enjoy the fruits of our moderation. For if we were to profess to bring forward better results than the ancients, after having taken the same road as they, no verbal skill could prevent the introduction of some comparison or rivalry as to wit or excellence or powers ;—not that there would be anything unlawful or novel in that, (for why may we not, in our own right,—a right not ours alone, but universal—why should we not criticise and set our mark upon any false discovery or position of theirs?) but granted that such a proceeding were just and allowable, still probably the contest would be an unequal one, on account of the different measure of our strengths. But when we set about opening out for the intellect a path entirely different from theirs, untried by them and unknown to them, the case is at once changed ; party zeal ceases ; and we sustain only the character of a guide, and this surely demands but a moderate share of authority, and depends upon good fortune rather than ability and excellence. And this warning refers to persons ; the other, to the subject-matter itself.

We, it must be understood, are very far from endeavouring to upset that philosophy which is now in vogue, or any other more accurate and enlarged than it, either present or to come. For we do not wish to hinder the philosophy at present in vogue, and others of the same class, from nourishing discussions, adorning discourses, or from being applied, and weightily so, to the duties of the Professor and the interests of social life. Moreover, we openly signify and declare that the philosophy which we are introducing will not be found very useful for these matters. It is not ready at hand : it is not grasped by the cursory reader ; it does not flatter the intellect by preconceived notions ; nor will it descend to the grasp of the vulgar, except by its utility and effects. And so let there be (and may each party find its share of happiness and fortune therein) two Sources and two Dispensations of Learning ; and, in like manner, two tribes, and, as it were, kindred lines of contemplators or philosophers ; and let them be in no way hostile or estranged, but bound in a close alliance by mutual good services ; let there be, in short, one method for cultivating the Sciences, and another for discovering them. And for those who find the first method preferable and more acceptable, on account of their impatience or the conventionalities of civil life, or because they cannot grasp and embrace the second through infirmity of mind (which must of necessity be the case with the great majority of men), they have our wishes that they may succeed happily and according to their desire in what they undertake, and attain what they pursue. But whosoever has the heart and the care not only to abide by what is discovered and to make use of it, but to penetrate into regions beyond, and to overcome not merely his adversary in disputing, but nature in results : in short, whosoever wishes not to spin fine and specious theories, but to attain to a certain and demonstrative knowledge, let such, as a true son of science, if he see good reason, join himself to us ; that on his

leaving the outer courts of Nature, which countless numbers have trodden, an entrance to her inmost chamber may, at length, be opened to him. And that we may be the better understood, and that our object may appear the more familiar by fixing on determinate names, we are accustomed to call the one method or way the Anticipation of the Mind, the other, the Interpretation of Nature.

We think that there is one more request to be made. We have certainly taken both thought and care that our propositions should not only be true, but should also reach the minds of men without inconvenience or harshness (strangely prepossessed and confined though they be). But still we may justly demand (especially in so great a restoration of Learning and Science), that whosoever wishes to come to any determination, or to form any judgment of this our work, under the direction of his own sense, or of the crowd of authorities, or of forms of demonstration (which have now obtained the weight of judicial laws), that he should not expect to be able to do so in a cursory way or while he is doing something else : but that he should make himself thoroughly acquainted with the matter, should himself try, little by little, the way which we trace out and construct ; should accustom himself to the subtlety of things which is pointed out by experience ; and, lastly, should correct by seasonable and, as it were, legitimate hesitation the depraved and deeply rooted habits of the mind : and then, finally (if it please him), when he has begun to be his own master, use his own judgment.

BOOK I.

APHORISMS ON THE INTERPRETATION OF NATURE AND THE KINGDOM OF MAN.

I. MAN, the servant and interpreter of Nature, performs and understands so much as he has collected concerning the order of Nature by observation or reason, nor do his powers or his knowledge extend farther.

ii. Neither the bare hand nor the understanding, left to itself, has much power : results are brought about by instruments and aids, which are no less needed for the intellect than the hand. And as instruments for the hand excite or regulate its motion, so, likewise, instruments for the mind either prompt the intellect or protect it.

iii. The knowledge and the power of man coincide, because ignorance of the cause involves the loss of the effect. For we can only conquer Nature by submitting to her ; and that which in contemplation occupies the place of the cause, in operation takes that of the rule.

iv. For the accomplishment of results man can do nothing more

than apply natural bodies and withdraw them: the rest Nature transacts within.

v. The Mechanist, the Mathematician, the Physicist, the Alchemist, and the Magician, are accustomed to grapple with Nature (as far as the production of results is concerned); but all (as things now stand) with feeble efforts and slight success.

vi. It would be madness, and a contradiction, to think that those things, which have never hitherto been done, can be done, unless by means never hitherto attempted.

vii. The productions of the mind and the hand seem very numerous in books and manufactures. But all that variety consists in an excessive subtlety, and in deductions from a few things which have become known; not in a number of Axioms.

viii. Even the results already discovered are due to chance and experiments rather than the Sciences; for the Sciences, as we now have them, are nothing but certain orderly arrangements of things previously discovered; not methods of discovery, or schemes for obtaining new results.

ix. But the one cause and root of nearly all evils in the Sciences is this, that while we falsely admire and extol the strength of the human mind, we do not seek its true aids.

x. The subtlety of Nature far exceeds the subtlety of sense and intellect: so that these fine meditations and speculations and reasonings of men are a sort of insanity; only there is no one at hand to remark it.

xi. As the Sciences which now prevail are useless for the discovery of results, so also the Logic which now prevails is useless for the discovery of Sciences.

xii. The Logic which is now in use has rather the effect of confirming and rendering permanent errors which are founded on vulgar conceptions, than of promoting the investigation of Truth: so that it does more harm than good.

xiii. The Syllogism is not applied to the principles of the Sciences; it is applied in vain to the middle Axioms, since it is far from being a match for the subtlety of Nature. And so it constrains assent, not things.

xiv. A Syllogism consists of propositions, propositions of words, and words are the symbols of conceptions. And so if the conceptions themselves (which are the groundwork of the whole) are confused and hastily abstracted from things, there will be no stability in the superstructure raised upon them. And so the only hope is in a true *Induction*.

xv. There is nothing found in the conceptions either of Logic or of Physics: the conceptions of Substance, of Quality, of Action, of Passion, even of Being, are not good; much less those of Weight, Lightness, Density, Rarity, Moisture, Dryness, Generation, Corruption, Attraction, Repulsion, Element, Matter, Form, and the like; but they are all fanciful and badly defined.

xvi. The conceptions of *infima species*, as Man, Dog, Pigeon, and

of the immediate apprehensions of the sense, as Hot, Cold, White, Black, do not greatly deceive us ; and yet even they are sometimes confused by the flux of matter and the intermingling of things : all others, which men have used up to this time, are errors, and unduly abstracted and drawn out from things.

xvii. Nor is there less license and error in determining Axioms than in abstracting conceptions : and that in the very principles which depend on common induction. But much more is this the case in axioms and inferior propositions, which are called forth by the Syllogism.

xviii. The discoveries hitherto made in the Sciences are of a kind usually bordering upon common conceptions ; but, in order that we may penetrate to the inner and more remote parts of Nature, it is necessary that conceptions, as well as axioms, should be abstracted from things by a more certain and better constructed way, and that a method of applying the intellect, altogether better and more certain, should be brought into use.

xix. There are and can be but two ways of investigating and discovering Truth. The one flies from sense and particulars to the most general axioms, and from these as first principles, and their undisputed truth, determines and discovers middle axioms ; and this is the way which is in use. The other draws out the axioms from sense and particulars, by ascending uniformly and step by step, so that at last it reaches the most general ; and this is the true way, but untried.

xx. The Intellect, when left to itself, enters on the same road that it follows according to the order of Logic, and this is the first. For the mind delights in starting off to wider generalities, that it may find rest, and after a short delay is disgusted with experience ; but these evils are, after all, exaggerated by Logic, on account of ostentatious disputations.

xxi. The Intellect, when left to itself, in a sober, patient, and grave disposition (especially if it be not hindered by received doctrines), sometimes tries the second way,—viz. the right one,—but makes little advance ; since the Intellect, without direction and assistance, acts irregularly, and is quite inadequate to overcoming the obscurity of things.

xxii. Each way begins from sense and particulars, and rests in the most general propositions : but yet they differ vastly ; since the one only touches cursorily on experience and particulars, while the other becomes duly and regularly familiar with them ; the one again, from the first beginning, lays down some abstract and useless generalities ; the other rises, step by step, to those things which are more familiar to Nature (*i.e.*, higher abstractions).

xxiii. There is no slight difference between the *idola* of the human mind and the *ideæ* of the divine mind ; that is, between certain vain conceits and the true marks and impressions made on created things as they are found by us.

xxiv. It can nowise be that Axioms established by a process of argument should be of use for the discovery of new results, because

the subtlety of Nature very far exceeds the subtlety of argument. But axioms duly and regularly abstracted from particulars easily again point out and mark down new particulars, and so render the Sciences active.

xxv. The Axioms which are in use have been drawn from a scanty and unassisted experience, and from a few particulars which most frequently occur, and are commonly made and extended according to their measure, so that it is not astonishing that they do not lead to new particulars. But if, by chance, some instance not hitherto remarked upon or known offers itself, the axiom is saved by some frivolous distinction, when it would have been more truthful to have corrected it.

xxvi. It is our custom, as a sort of guide, to call the method which men ordinarily apply to Nature *Anticipations of Nature*, because it is hasty and premature; but that method which is elicited from things by legitimate means we call *Interpretation of Nature*.

xxvii. *Anticipations* are sufficiently strong to ensure consent, inasmuch as if men were even to go mad after one uniform fashion, they would be able to agree tolerably among themselves.

xxviii. Moreover, *Anticipations* are far more effective in winning assent than *Interpretations*, because, as they are collected from a few instances, and mostly from those which are of familiar occurrence, they immediately dazzle the intellect and fill the imagination; while, on the other hand, *Interpretations*, being collected over a wide field from things exceedingly different and lying far apart, cannot strike the intellect suddenly: so that for opinions they must seem harsh and discordant—almost like mysteries of faith.

xxix. In the sciences which are based on opinions and arbitrary views, the use of *Anticipations* and Logic is good, since it is their business to subdue assent, not things.

xxx. No great progress could be made in the Sciences by means of *Anticipations*, even if all the abilities of all ages were to unite and to combine their labours and transmit them downward; because errors which are radical, and have their seat in the first digestive process of the mind, cannot be cured by the excellence of the functions and remedies which are subsequent.

xxxi. It is vain to expect a great increase in knowledge from the superinducing and ingrafting of new things upon the old; but a new beginning must be made from the lowest foundations, unless we wish to be continually revolving in a circle, with a trifling and almost contemptible advance.

xxxii. The honour of the ancient authorities, and indeed of all, remain untouched; for the comparison now introduced is not one of abilities or powers, but of method; and we ourselves do not sustain the character of a judge, but of a guide.

xxxiii. No correct judgment (we must speak openly) can be formed, either of our method or the discoveries made in conformity with it, by means of *Anticipations* (I mean the method which is in use), since we ought not to be required to come under judgment of that very system which we are calling in question.

xxxiv. Nor is it an easy matter to deliver or explain what we bring forward ; for that which is new in itself will nevertheless be understood by reference to the old.

xxxv. Borgia said of the expedition of the French into Italy, that they came with chalk in their hands to mark their quarters, and not with arms to force their way. And so it is our plan that our teaching should quietly make its entrance into minds fit for and capable of receiving it : for there is no use in confuting those with whom we differ about first principles and conceptions themselves, and even about the forms of demonstration,

xxxvi. Still one means of delivering our sentiments, and that a simple one, remains to us ; viz., to bring men to actual particulars, their series and orders ; and that they again should impose on themselves, for a time, a renunciation of notions, and begin to acquaint themselves with actual things.

xxxvii. The method of those who hold the doctrine of Acatalepsy, and our way, agree in a certain measure at starting ; but in their results they are widely separated and opposed : for they simply assert the impossibility of all knowledge ; we assert the impossibility of much knowledge of Nature by the method which is now in use : they forthwith destroy the authority of sense and intellect ; we think out, and supply aids for the same.

xxxviii. *Idola* and false conceptions which have hitherto occupied the intellect of man, and are deeply planted therein, not only so beset the minds of men that it is difficult for truth to obtain an entrance, but even when entrance has been granted and allowed, they will again meet us in the very instauration of the Sciences, and be troublesome, unless men are forewarned, and fortify themselves against them, as far as it can be done.

xxxix. There are four kinds of *idola* which beset the minds of men ; and, with a view to distinctness, we have given them names, and have called the first kind "*idola* of the tribe ;" the second, "*idola* of the cavern ;" the third, "*idola* of the market-place ;" the fourth, "*idola* of the theatre."

xl. To draw out conceptions and axioms by a true *induction* is certainly the proper remedy for repelling and removing *idola* ; but still it is of great advantage to indicate the *idola*. For the doctrine of *idola* holds the same position in the *interpretation of Nature*, as that of the confutation of sophisms does in common Logic.

xli. The *idola of the tribe* have their foundation in human nature itself, and in the very tribe or race of man. For it is a false assertion that human sense is the measure of things ; on the contrary, all perceptions, both of sense and also of mind, are referred to man as their measure, and not to the universe. And the human intellect is like an uneven mirror on which the rays of objects fall, and which mixes up its own nature with that of the object, and distorts and destroys it.

xlii. The *idola of the cavern* are the *idola* peculiar to the individual. For each man has (besides the generic aberrations belonging to his human nature) some individual cavern or den which breaks and cor-

rupts the light of Nature ; either by reason of his peculiar and individual nature, or of his education and intercourse with others, or of the reading of books and the several authorities of those whom he studies and admires ; or by reason of differences of impressions as they arise in a mind preoccupied and predisposed, or in a mind of even and sedate temperament, or the like ; so that evidently the spirit of man (according to its disposition in each individual) is variable, completely confused, and, as it were, the plaything of chance : whence Heraclitus has well said, "Men seek knowledge in lesser worlds, and not in the greater or common one."

xlili. There are also *idola* arising, as it were, from the mutual intercourse and society of mankind, and these we call *idola of the marketplace*, on account of their reference to the commerce and association of men. For speech is the means of intercourse among men ; but words are imposed upon us according to popular acceptance. And so a bad and foolish imposition of words comes strangely to obstruct the mind. Nor do definitions and explanations, with which the learned have been wont to fortify and clear themselves in some instances, in any way restore the matter to its proper footing. But words plainly put constraint upon the intellect, and throw all into confusion, and lead men into vain and innumerable controversies and fallacies.

xliv. Lastly, there are *idola* which have passed into the minds of men out of the different dogmas of philosophical systems, and even from the perverted laws of demonstrations, and these we call *idola of the theatre* : for we consider all the philosophic systems hitherto received or invented as so many plays brought on the stage and acted out, creating each its fictitious and scenic world. Nor do we speak of the systems at present in fashion alone, or even of the old philosophies and sects, since very many plays of the same kind might be put together and harmonized ; for errors the most diverse have nevertheless, for the most part, common causes. Nor, again, do we understand this of complete philosophies alone, but even of very many principles and axioms of the Sciences, which have obtained strength from tradition, credulity, and neglect. But we must speak more distinctly, and at large, of each of these kinds of *idola*, that the human Intellect may be put on its guard.

xlv. The human Intellect, from its peculiar nature, easily supposes a greater order and equality in things than it actually finds ; and, while there are many things in Nature unique, and quite irregular, still it feigns parallels, correspondents, and relations which have no existence. Hence that fiction, "that among the heavenly bodies all motion takes place by perfect circles," spirals and eccentrics being altogether rejected (except in name). Hence the element of fire, with its orb, is introduced to make up the quaternion with the remaining three which are exposed to our senses. And further, to the elements (as they are called) there is arbitrarily assigned a progression in rarity increasing by powers of ten, and other fancies of this kind. Nor does this trifling prevail in dogmas only, but even in simple conceptions.

xlvi. The human Intellect, in those things which have once pleased

it (either because they are generally received and believed, or because they suit the taste), brings everything else to support and agree with them ; and though the weight and number of contradictory instances be superior, still it either overlooks or despises them, or gets rid of them by creating distinctions, not without great and injurious prejudice, that the authority of these previous conclusions may be maintained inviolate. And so he made a good answer, who, when he was shown, hung up in the temple, the votive tablets of those who had fulfilled their vows after escaping from shipwreck, and was pressed with the question, "Did he not then recognize the will of the gods?" asked, in his turn, "But where are the pictures of those who have perished, notwithstanding their vows?" The same holds true of almost every superstition—as astrology, dreams, omens, judgments, and the like—wherein men, pleased with such vanities, attend to those events which are fulfilments ; but neglect and pass over the instances where they fail (though this is much more frequently the case). But this evil insinuates itself with far more subtlety in Philosophy and the Sciences, in which anything which is once approved vitiates everything else and reduces it to subjection (though the latter be much surer and more powerful). Moreover, even supposing this self-pleasing and vanity, of which we have spoken, to be absent, still such is the peculiar and continual disposition to error of the human Intellect, that it is more moved and roused by affirmations than negations, when it ought in due order to treat both impartially ; nay, in establishing any true Axiom, the influence of the negative instance is the greater.

xlvi. The human Intellect is most moved by those things which can strike and enter the mind simultaneously and suddenly ; by which the fancy is usually filled and inflated ; it then in some way, though quite imperceptibly, represents and supposes everything else to be similarly constituted to those few objects by which the mind is beset ; but the intellect is exceedingly slow, and unfit for that transition to remote and heterogeneous influences by which Axioms are proved as by fire, unless the office be imposed upon it by strict laws and force of authority.

xlvi. The human Intellect is unquiet, and cannot halt or rest, but presses onward, yet in vain. And so we cannot conceive any extreme or limit to the universe, but it always occurs, as if a necessity, that there must be something beyond. Nor, again, can we conceive how eternity has flowed down to this present day, since the distinction which is usually received between the infinite "*a parte ante*," and "*a parte post*," cannot by any means stand, since it would thence follow that one infinity is greater than another infinity, and so that infinity may be lessening and verging to the finite. There is a similar subtlety as regards the divisibility of lines, arising from the impotence of thought. But this impotence of mind interferes with more pernicious results in the discovery of causes ; for though the highest universals in Nature ought to be positive, just as they are discovered, and are not really referable to causation, yet the human Intellect, incapable of resting, still seeks something better known. But then, whilst aim-

ing at what is further off, it falls back to what is nearer, viz., to final causes, which clearly have their origin rather in the nature of man than that of the universe, and from this source they have wonderfully corrupted philosophy. But it is the mark of a philosopher as unskilled as he is shallow to look for causes in the highest universals, and not to require them in subordinate and lower truths.

xlix. The human Intellect is not of the character of a dry light, but receives a tincture from the will and affections, which generates "sciences after its own will;" for man more readily believes what he wishes to be true. And so it rejects difficult things, from impatience of inquiry;—sober things, because they narrow hope;—the deeper things of Nature, from superstition;—the light of experience, from arrogance and disdain, lest the mind should seem to be occupied with worthless and changing matters;—paradoxes, from a fear of the opinion of the vulgar:—in short, the affections enter and corrupt the intellect in innumerable ways, and these sometimes imperceptible.

l. But by far the greatest hindrance and aberration of the human Intellect proceeds from the dulness, incompetency, and fallacies of the senses, so that those things which strike the sense outweigh those which do not do so directly, although these latter be the more weighty. And thus contemplation generally ends with sight, so that there is little or no observation of invisible objects. Hence all operations of spirits enclosed in tangible bodies are concealed, and escape the notice of men. All the more subtle changes, moreover, in the disposition of the parts of grosser things (which we commonly call alteration, while it is really motion *per minima*), lie concealed in like manner; and yet unless the two operations we have mentioned be explored and brought into the light, no great results can be accomplished in Nature. Again, the very nature of common air, and of all bodies whose density is less than that of air (and they are very many), is nearly unknown. For sense by itself is a weak thing and liable to error; nor are instruments of much use for enlarging the powers of the senses, or sharpening them; but all true interpretation of Nature is brought about by instances, and fit and appropriate experiments, where the sense judges only of the experiment, the experiment of Nature and the thing itself.

li. The human Intellect is by its own nature prone to abstractions, and imagines those things which are variable to be constant. But it is better to dissect Nature than to resolve her into abstractions, as did the school of Democritus, which penetrated farther into Nature than did the rest. We should rather consider matter, its dispositions and changes of disposition, its simple action and law of action, or motion: for forms are figments of the human mind, unless we choose to call these laws of actions forms.

lii. Of this kind, therefore, are the *idola* which we call the *idola of the tribe*, which have their origin either in the uniformity of the substance of man's spirit, or in its prejudices, or in its narrowness, or in its restlessness, or in its being coloured by the affections, or in the incompetency of the senses, or in the manner of the impression.

liii. The *idola of the cavern* take their rise from the peculiar nature of each individual both in mind and body, and also from education, habit, and accident. And although this class of *idola* is varied and manifold, yet we will set forth those cases in which caution is most needed, and which have the greatest influence in corrupting the purity of the intellect.

liv. Mankind are attached to particular sciences and trains of thought, either because they believe themselves to have originated and discovered them, or because they have bestowed their greatest labour upon them, and have become most familiar with them. But if men of this kind betake themselves to philosophy and the contemplation of generalities, they distort them by their former fancies, and so corrupt them; as is most especially conspicuous in Aristotle, who has made his Natural Philosophy so completely subservient to his Logic as to render it nearly useless, and a mere vehicle for controversy. The chemists, on the other hand, out of a few experiments of the furnace, have constructed a philosophy at once fantastic and limited in its range. Gilbert, moreover, after he had employed himself most laboriously in the consideration of the magnet, forthwith contrived a system of philosophy in accordance with the subject in which he himself felt so overwhelming an interest.

lv. The greatest and, as it were, the radical distinction between minds, as far as philosophy and the sciences are concerned, is this: that some are stronger and more fitted for marking the differences of things; others, for noting their resemblances. For constant and acute dispositions can fix their thoughts, can pause, and fasten upon every subtlety of difference; but those that are lofty and discursive recognize and compare even the most delicate and general resemblances; while each falls easily into excess, by grasping either at the nice differences of things or at shadows.

lvi. Some dispositions are possessed with an excessive admiration of what is old, others pour themselves out in the vehement desire to embrace what is new; but few possess the temperament necessary to preserve the middle course, so as neither to pluck up what has been rightly laid down by the ancients, nor to despise what has been rightly added by the moderns. Now this causes great detriment to the Sciences and Philosophy, since it gives us party views, rather than fair judgments, on questions of antiquity and novelty, whereas truth ought not to be sought from the felicity of any particular time, which is variable, but from the light of Nature and Experience, which is eternal. And so these party-likings are to be renounced; and we must take heed lest the intellect be carried away by them into consent.

lvii. The consideration of Nature and of bodies in their simple forms breaks up and distracts the intellect; but the consideration of Nature and of bodies in their compound state, and in their configurations, stupefies and relaxes it. This is best seen in the school of Leucippus and Democritus, as compared with the other systems of philosophy. For that school is so occupied with treating of the

particles of things as almost to neglect their general structure, while the others look with such astonishment upon the structures that they do not penetrate to the simple forms of Nature; these two kinds of contemplation should, therefore, be interchanged and taken in turn, that the intellect may be rendered at once penetrating and capacious, and that the inconveniences which we have mentioned, and the *idola* springing out of them, may be avoided.

lviii. Let us, therefore, exercise this foresight in our contemplations, in keeping at a distance and getting rid of the *idola of the cave*, which mostly arise from some predominating influence, from excess in composition and division, from party-liking for particular times, or from the magnitude or minuteness of the object. And, as a general rule, every one who contemplates the nature of things should distrust whatever most readily takes and holds captive his own intellect, and should use so much the more caution in coming to determinations of this kind, that his understanding may remain impartial and clear.

lix. But the *idola of the market-place* are the most troublesome of all; those, namely, which have crept into the understanding from the association of words and names. For men believe that their reason governs words: but it also happens that words have a reflex action of their own upon the understanding; and this has rendered Philosophy and the Sciences sophistical and inactive. Now words are for the most part used in accordance with the popular acceptance, and define things by lines most obvious to the popular intellect. When, however, a sharper intellect, or a more diligent observer wishes to shift these lines, and to place them more according to Nature, words cry out against it. Whence it happens that great and grand discussions of learned men often end in controversies about words and names, while it would be more advisable to start from these (according to the prudent custom of the Mathematicians), and to reduce them to order by definitions. And yet these definitions, in the case of natural and material things, cannot cure this evil, since both definitions themselves consist of words, and words beget words; so that it is necessary to recur to particular instances, and their series and orders, as we shall presently mention, when we shall have come to the manner and plan of constituting conceptions and axioms.

lx. *Idola*, which are imposed on the intellect by means of words, are of two kinds; either they are the names of things which have no existence (for as there are things without names through want of observation, so there are also names without things through fanciful supposition), or they are names of things which do exist, but are confused and ill-defined, and hastily and partially abstracted from things. Of the former kind are—Chance, the *primum mobile*, the Orbits of the Planets, the Element of Fire, and figments of the like kind, which have their rise in vain and false theories; and this class of *idola* is the more easily got rid of, because they can be exterminated by a constant refutation of the theories and by their becoming obsolete.

But the other kind, which is caused by bad and unskilful abstraction, is intricate, and takes a deep hold. *E.g.*, take some word (*moist*, if

you please), and let us see how the different things signified by this word agree with one another ;—we shall find that that word *moist* is nothing but a confused symbol of different actions, which admit of no consistency or reduction to rule. For it signifies that which readily spreads itself round another body ; that which is in itself undeterminable and has no consistence ; that which yields easily in all directions ; that which readily divides and disperses itself ; that which easily collects and unites itself ; that which flows and is set in motion readily ; that which readily adheres to another body, and makes it wet ; that which is readily reduced to a liquid state, or melts, when it before possessed consistency. And so when we come to predicate or employ this name : if we take one sense, flame is moist ; if another, air is not moist ; if another, fine powder is moist ; if another, glass is moist ; so that it readily appears that this conception is hastily abstracted from water only, and from common and ordinary liquids, and without any due verification.

But more—there are in words certain degrees of faultiness and error. A less faulty kind is that of the names of some substance, especially of *infimæ species*, and these well deduced (for the conceptions of *chalk* and *mud* are good, that of *earth*, bad) ; more faulty is the class of actions, as *generation*, *corruption*, *alteration* ; most faulty that of qualities (with the exception of the immediate objects of sense), as *heavy*, *light*, *rare*, *dense*, &c. ; and yet, among all these, some conceptions must be a little better than others, according as a greater or less number of things strikes the sense of man.

lxi. But the *idola of the theatre* are not innate, nor have they secretly insinuated themselves into the intellect, but are plainly introduced and received from the plays of theory, and perverse laws of demonstrations. To attempt, however, or to undertake their confutation would be by no means consistent with our previous declarations. For seeing that we agree neither in first principles, nor yet in demonstrations, all discussion is at an end. And this is fortunate, for so the ancients preserve their rightful honour. For they suffer no detraction, since the question is exclusively of the path to be pursued. For a lame man (as the saying goes), in the right path, outstrips the swift runner out of it. And it is manifestly clear that, when a man is running out of the right road, his superior skill and swiftness will lead him proportionately further astray. But our method of discovering the Sciences is such as to leave little to the sharpness and strength of men's wits, but to bring all wits and intellects nearly to a level. For as in drawing a straight line, or describing an accurate circle by the unassisted hand, much depends on its steadiness and practice, but if a rule or a pair of compasses be applied, little or nothing depends upon them, so exactly is it with our method. Now although it is of no use to descend to individual confutations, still we must say something of the sects and classes of theories of this sort, and afterwards something concerning the external tokens of their weakness ; and, lastly, we must say a little about the causes of so great a misfortune, and of so long and general an agreement in error, that the approach

to the truth may be rendered less difficult, and the human Intellect be more readily purified, and brought to dismiss its *idola*.

Ixii. *The idola of the theatre*, or of theories, are numerous, and may, and perhaps will, some day be more so. For if men's minds had not been, these many generations, occupied with religion and theology, and had not civil politics also (especially monarchies) been so averse to such novelties, even in matters of contemplation, that if men apply themselves to them, they must do so with risk and injury to their fortunes, and not only go without reward, but expose themselves to derision and ill-will; had this not been the case, without doubt, many other sects of philosophers and theories would have been introduced, similar to those which once flourished in great variety among the Greeks. For, as many systems of the heavens may be fabricated out of the phenomena of the sky, so likewise, in a much greater degree, may dogmas of different kinds be founded and built up on the phenomena of philosophy. And plays of this kind of Theatre have this also in common with those current in the Theatre of the poets, that the stories invented for the stage are neater, more elegant, and more agreeable to the taste than the true stories of history.

In general, however, in preparing the subject-matter of Philosophy, men either draw a great deal from a few instances, or a little from a great number; so that, in either case, Philosophy is founded on too narrow a basis of experience and natural history, and dogmatizes on too insufficient evidence. For the "rational" class of philosophizers seize various common circumstances from experience, without ascertaining them for certain, or diligently examining and weighing them; they leave the rest to reflection and activity of wit.

There is another class of philosophers who have worked diligently and accurately in a few experiments, and have ventured thence to educe and construct systems of philosophy: twisting everything else into agreement with them after a wonderful fashion.

There is also a third class, who, influenced by faith and a spirit of veneration, introduce theology and traditions; some of whom, in their folly, have gone so far out of the way as to seek and to derive the Sciences from spirits, forsooth, and genii: so that the source of error, like the false philosophy, is of three kinds, *sophistical*, *empirical*, and *superstitious*.

Ixiii. We have a most conspicuous example of the first class in Aristotle, who has corrupted Natural Philosophy with his Logic;—thus he has made the Universe out of Categories; has assigned to the human soul—that noblest of substances—a genus from words of second intention; determined the question of density and rarity, by which bodies occupy greater and less dimensions or spaces, by the cold distinction between act and power; asserted that each body has its peculiar and proper motion, and that, if it partakes of another motion, it is moved from another source; and has conferred countless other laws upon the nature of things at his own will: being everywhere more anxious to show how a man may extricate himself from a

difficulty by an answer, and some positive reply may be rendered in words, than solicitous about the inner truth of things; as is best shown by comparing his philosophy with the other philosophies which were famous among the Greeks. For the similar constituent parts of Anaxagoras, the atoms of Leucippus and Democritus, the heaven and earth of Parmenides, the strife and friendship of Empedocles, the resolution of bodies into the indifferent nature of fire and recondensation of the same, of Heraclitus, show something of the natural philosopher, and savour of the nature of things, of experience, and of the study of bodies; while the Physics of Aristotle are nothing more than the echo of his Dialectics; and he has also, in his Metaphysics, again treated these under a more imposing title, and more as a Realist, forsooth, than a Nominalist. Nor let much importance be given to the fact that in his Books on Animals, and in the *Pi ebemata*, and in his other treatises, frequent recourse is had to experiments. For he had previously made up his mind, without having properly consulted experience for the purpose of establishing his decisions and axioms; but after coming to an arbitrary decision, he twists experience to suit his views, dragging her about with him as his captive. So that, even on this head, he is more open to accusation than his followers in modern times (the race of scholastic philosophers), who have altogether abandoned experience.

Ixiv. But the *empiric* school of philosophy produces conceits more deformed and monstrous than the sophistic or rational, inasmuch as it is founded not on the light of vulgar conceptions (which, although slight and superficial, is yet in a manner universal and generally pertinent), but on a few narrow and obscure experiments. And so such a philosophy appears probable and almost certain to those who are daily occupied in experiments of this kind, and have by that very means corrupted their imagination: to all others it appears incredible and vain. A notable example of this is to be seen in the chemists and their dogmas; however, this is scarcely to be found, at the present day, elsewhere than perhaps in the philosophy of Gilbert. But still a caution as to the philosophies of this kind was by no means to be omitted, because we already foresee and prophesy, that if ever men should be roused by our advice to devote themselves seriously to experience, and bid farewell to sophistical teaching; then a great danger will be imminent from this kind of philosophy, on account of the premature and rash haste of the intellect, and its jumping and flying to generalities and the first principles of things. This evil we ought even now to meet.

Ixv. But the corruption of philosophy by the admixture of superstition and theology spreads much further, and introduces the greatest mischief into systems of philosophy, whether considered as complete or in their parts. For the human Intellect is no less exposed to the impressions of fancy than to those of vulgar conceptions. For the disputatious and sophistical school of philosophy ensnares the intellect; but the other, which is fanciful and turgid, and as it were poetical, rather flatters it. For there is inherent in man's intellect, no

less than in his will, a certain ambition, and this is especially the case with profound and lofty minds. An example of this kind is very apparent among the Greeks, especially in Pythagoras : here, however, it is combined with a more gross and burdensome superstition ; while it is more dangerous and more subtle in Plato and his school. This kind of mischief also appears in parts of the other Philosophies—in the introduction of *abstract forms*, *final causes*, and *first causes*, in the very frequent omission of *middle causes*, and the like. But in this matter the greatest caution must be employed, for the apotheosis of error is the worst of all evils ; and it must be esteemed as the very plague of the intellect when vanity comes to be worshipped. But some of the moderns, however, have indulged in this folly, with such consummate carelessness, as to have endeavoured to found a natural philosophy on the first chapter of Genesis, the book of Job, and other passages of Holy Scripture—"seeking the dead among the living." And this folly is the more to be prevented and restrained, because, from the unsound admixture of things divine and human, there arises not merely a phantastic philosophy, but also a heretical religion. And so it is a very salutary thing, with all sobriety of mind, to render unto faith those things only that are faith's.

Ixvi. We have already spoken of the vicious authorities of philosophers which are founded either on vulgar conceptions, on a few experiments, or on superstition. We must further speak of the faulty materials of contemplation, especially in Natural Philosophy. For the human Intellect is affected by observing the action of the mechanical arts, where bodies are changed in the highest possible degree by composition and separation, so that it thinks that some similar process is going on in the universal nature of things. And hence arose that fiction of elements, and of their meeting to form natural bodies. Again, when man contemplates the liberty of Nature, he comes upon species of things, of animals, plants, minerals, and thence he easily glides into the idea that there are in Nature certain primary forms of things which Nature is striving to draw out ; and that all the variety proceeds either from impediments and aberrations which Nature meets with in completing her task, or from the collision of different species, and the transplanting of one into the other. And the first idea has given birth to the first elementary qualities, the second, to the occult properties and specific virtues : and each of them refers to empty *compendia* of contemplation, with which the mind rests contented, and is diverted from more solid subjects. But physicians employ their labour to better advantage on secondary qualities and operations of things, as *attraction*, *repulsion*, *rarification*, *condensation*, *astriction*, *discussion*, *maturation*, and the like ; and would have succeeded much better had they not, by means of these two *compendia* which I have mentioned—that is to say, elementary qualities and specific virtues—corrupted those of the second kind, which have been the subject of true investigation, by reducing them to first qualities, and their subtle and incommensurable combinations ; or else by not carrying them on, with a wider and more diligent observation, to third

and fourth qualities ; but, instead of this, unseasonably interrupting their contemplation. Nor are virtues of this kind (I do not speak of those which are identical, but of those which are similar) only to be investigated among the medicines of the human body, but also in the changes of other natural bodies.

But a much greater evil arises from the fact that the quiescent first principles of things *out of which*, and not the motive principles *by which* things have their being, are the subjects of contemplation and inquiry. For the former refer only to discussion, the latter to results. Nor are these vulgar distinctions of any value which are set down as acknowledged in natural philosophy, such as *generation*, *corruption*, *augmentation*, *diminution*, *alteration*, and *translation*. For, indeed, they mean this, that if a body, not otherwise moved, be yet moved in place, this is *translation*; if it be changed in quality, its place and species remaining, this is *alteration*; but if after that change the mass itself and the bulk do not remain the same, this is the motion of *augmentation* or *diminution*; and if the change goes so far as to affect both species and substance, and cause a transference into others, this is *generation* and *corruption*. But these are merely popular phrases, and do not pierce below the surface of Nature, and they are measures only and periods, not species of motion. For they only suggest the question, "how far," not "in what manner," or "from what source." For they show us nothing of the affections of bodies, or the procession of their parts, but only commence their distinctions from the moment when that motion exhibits grossly the thing, in its altered condition, to the sense. And when they wish to tell us something about the cause of motions, and to institute a division among them, they introduce a distinction between natural and violent motion in the most slovenly way; and this itself arises from a vulgar conception, since all violent motion is also, in fact, natural, inasmuch as it takes place when an external agent puts Nature into operation otherwise than before.

But—leaving these—if any one (for example) were to observe that there is in bodies a mutual affection for contact, which will not allow the unity of nature to be entirely taken away or cut off, so as to form a vacuum; or if any one were to say that there is in bodies an affection for restoring themselves to their natural dimensions or extension, so that on being compressed within it, or stretched beyond it, they immediately endeavour to recover and restore themselves to their original volume and extent; or if any one were to say that there is in bodies a tendency to congregate towards kindred masses, viz., dense bodies towards the earth, the thinner and rarer to the expanse of the heavens; these and the like are really physical kinds of motions. But those others are clearly logical and scholastic, as is evident from this comparison of them.

Nor is it a less evil, that, in their philosophies and contemplations, men spend their labour in investigating and treating of the first principles of things and the extreme limits of nature, when all that is useful and of avail in operation is to be found in what is intermediate. Hence it happens that men continue to abstract Nature till they arrive

at potential and unformed matter : and, again, they continue to divide Nature, until they have arrived at the atom ; things which, even if true, can be of little use in helping on the fortunes of men.

Ixvii. The Intellect must also be cautioned against the intemperance of philosophers in granting or withholding consent ; because intemperance of this kind seems to fix *idola*, and in a manner to render them permanent, so as to prevent all approach for the purpose of removing them.

Now this excess is of two kinds : the first appears in those who dogmatize promptly, and render the Sciences positive and magisterial ; the second, in those who introduce Acatalepsy ; and a vague and endless inquiry. Of these, the former depresses the intellect, the latter enervates it. For the Philosophy of Aristotle, having murdered the other systems (as the Turks serve their brethren) with quarrelsome confutations, has dogmatized on each separate point : and he himself again introduces questions at his own will, and then despatches them, that everything may be sure and determined ; a practice which obtains and is in use among his successors.

But it was the school of Plato that introduced Acatalepsy, first as if in jest and irony, out of dislike for the old sophists, Protagoras, Hippias, and the rest, who feared nothing so much as the appearance of doubt on any subject. But the new Academy raised Acatalepsy into a dogma, and held it as a doctrine. And though this method of proceeding be more honest than the licence of dogmatizing, since they profess that they are far from confounding inquiry, as Pyrrho and the Ephectics did, but have something to follow as probable, though they have nothing to retain as true ; still, when the human mind has once despaired of finding truth, its action on everything around it becomes more languid ; whence it happens that men turn aside to agreeable controversies and discourses, and wander, as it were, from one thing to another, rather than sustain any severe injury. But as we said in the beginning, and are continually urging, we must not deprive the human senses and understanding, infirm though they be, of their authority, but must provide aids for them.

Ixviii. And now we have spoken of the several kinds of *idola*, and their belongings ; all of which must be renounced and abjured with a constant and solemn determination, and the Intellect entirely freed and purged from them, so that the approach to the Kingdom of Man, which is founded on the Sciences, may be like that to the Kingdom of Heaven, into which none may enter save in the character of a little child.

Ixix. But faulty demonstrations are, as it were, the strongholds and defences of *idola* ; and those which we have in Logic come little short of making over the universe in bondage to human thoughts, and of giving thoughts in bondage to words. But demonstrations are, in their potentiality, the Philosophies themselves, and the Sciences. For such as they are, and as they are rightly or wrongly constituted, such are the resulting Philosophies and Contemplations. But those which we employ in the whole of that process, which leads from sense and

things to axioms and conclusions, are fallacious and insufficient. And this process is fourfold, both in its action and its faults. In the first place, the impressions of the sense itself are faulty, for the sense both fails and deceives us. Now its failures should be supplied, and its deceptions rectified. In the second place, notions are abstracted in a faulty manner from impressions of the senses, and they are undetermined and confused where they should be determined and well-defined. In the third place, that induction is faulty which infers the first principles of the Sciences by simple enumeration, without applying the due exclusions and solutions, or separations, of Nature. Lastly, that method of discovery and proof, in which the most general principles are first established, and then middle axioms are introduced and proved by them, is the parent of errors, and the ruin of all Sciences. But of these things, which we now touch upon but lightly, we shall speak more fully, when, having finished these expiations and purgations of the mind, we come to set forth the true way of interpreting Nature.

lxx. But by far the best demonstration is Experience, provided it adheres to actual experiment. For if it be transferred to other cases which are thought to be similar, unless that transfer be made duly and in order, it is a fallacious thing. But the method of consulting Experience which men now employ is blind and stupid. And so, while they go wandering and roaming about without any certain path, taking counsel only from chance circumstances, they are carried about in many directions, but make little advance; sometimes they are in good spirits, sometimes they are distracted; and they are always discovering something beyond to be sought. Now it commonly happens that men seek Experience carelessly, and, as it were, in sport, slightly varying experiments already known; and if the matter does not turn out well, getting disgusted, and giving up the attempt. And if they apply themselves more seriously, steadily, and laboriously to experiment, still they bestow their labour in working out some one experiment, as Gilbert has done with the magnet, the chemists with gold. And in doing this they show their design to be as unskilful as it is slight. For no one is fortunate in investigating the nature of anything in the thing itself, but the inquiry must be widened so as to reach what is more general.

But even when they do labour to construct some Science and dogmas out of experiments, they nevertheless almost always turn aside with an over-hasty and unseasonable eagerness to practice; not only for the sake of the use and fruits of that practice, but that they may secure in some new work a sort of pledge for themselves that they will not be employing themselves unprofitably in what remains behind; and also to puff themselves off to others, that they may obtain a better reputation for the business with which they are occupied. So it happens that, like Atalanta, they swerve from the path to pick up the golden apple, and in the meanwhile interrupt their race, and let the victory slip out of their hands. But in the true course of Experience, and the carrying it forward to fresh works, the Divine Wisdom and Order should be taken in all respects as an example. For God, on the first

day of the creation, created light only, and allowed a whole day for that work ; nor did He create anything material on that day. In like manner, in every kind of Experience we must first elicit the discovery of causes and true axioms, and must look for experiments which produce light, and not those which produce fruit. Now axioms, when rightly discovered and constructed, furnish a practice which is not restricted but copious, and draw after them bands and troops of results. But concerning the ways of seeking Experience, which are no less beset, and blocked up, than are the ways of exercising judgment, we shall speak hereafter ; at present we have only been mentioning ordinary Experience as a faulty kind of demonstration. But now the order of things requires that we should add a few remarks concerning those *signs* which we mentioned a short time ago (signs that the Philosophies and Contemplations now in use are faulty), and concerning the causes of a fact which at first sight appears so strange and incredible. For a knowledge of signs prepares the way for assent ; an explanation of causes removes the marvel. And these two things aid much in rendering the extirpation of *idola* from the understanding more easy and gentle.

lxxi. The Sciences which we possess have come down to us principally from the Greeks. For what has been added by Roman, Arab, or later writers, is neither much, nor of great moment ; but such as it is, is founded on the discoveries of the Greeks. Now the wisdom of the Greeks was professorial, and given to disputations—a character most adverse to inquiry after truth ; and so that title of Sophist, which was contemptuously thrown back and transferred to the ancient rhetoricians, Gorgias, Protagoras, Hippias, Polus, by those who wished to be esteemed philosophers, suits also the whole class, Plato, Aristotle, Zeno, Epicurus, Theophrastus, and their successors, Chrysippus, Carneades, and the rest. There was this difference only, that the former class was vagrant and mercenary, perambulating the different states, parading their wisdom, and exacting a price for it ; while the latter was more staid and liberal, in that its members had fixed residence, opened schools, and taught Philosophy for nothing. Both kinds, however, though differing in other respects, were professorial ; both degraded the matter into disputation, both instituted certain philosophical facts and heresies, and did battle for them ; so that their teachings were almost (as Dionysius has not inaptly objected against Plato) “ words of idle old men to inexperienced youth.” But those older Greeks, Empedocles, Anaxagoras, Leucippus, Democritus, Parmenides, Heraclitus, Xenophanes, Philolaus, and the rest (for we omit Pythagoras as superstitious), opened no schools that we know of, but betook themselves to the inquiry after truth with greater silence, with more severity and simplicity, that is, with less affectation and parade. And so theirs, in our judgment, was the better course, were it not that their works have been extinguished in the course of time by those of shallower men, who are more successful in responding to and pleasing the apprehension and feelings of the many ; time, like a river, bringing down to us things which are lighter and more inflated,

but letting what is more weighty and solid sink. And yet even they were not altogether free from the vice of their nation, but inclined too much to the ambition and vanity of founding a sect, and catching popular applause. Now the inquiry after truth must be considered desperate when it turns aside after trifles of this kind. Nor should we omit that judgment, or rather oracular utterance, of the Egyptian priest about the Greeks :—"That they were always children, and possessed neither antiquity of knowledge, nor knowledge of antiquity." And certainly they have this characteristic of children, that they are prompt at prattling, but cannot generate ; for their wisdom appears to be full of words, but barren of results. Hence the signs which are taken from the origin and generation of the prevalent philosophy are not good.

lxxii. Nor are the Signs which may be gathered from the nature of the time and age much better than those which are obtained from the nature of the place and nation. For during that age there was but a narrow and scanty knowledge either of time or the world ; which is an exceeding great fault, especially for those who place all their reliance in Experience. For they had no history, reaching over a thousand years, worthy of the name, but fables and rumours of antiquity. And of the regions and countries of the world they knew but a small portion ; for instance, they called all the inhabitants of the north, indiscriminately, Scythians ; all those of the west, Celts ; they knew nothing in Africa beyond the hither portion of Ethiopia ; nothing in Asia beyond the Ganges. Much less were they acquainted with the provinces of the New World, even by hearsay, or any certain and constant report ; yea, and very many climates and zones, in which innumerable nations live and breathe, were pronounced by them to be uninhabitable : moreover, the excursions of Democritus, Plato, and Pythagoras, which were certainly not to a distance, but rather suburban rambles, were celebrated as something great. But in our times, both many parts of the New World, and the limits of the Old on all sides, are familiar to us, and the stock of experiments has increased to infinity. Wherefore, if we are to take signs (as the astrologers do) from the time of their nativity of birth, we find that nothing of great importance is signified concerning these Philosophies.

lxxiii. Among Signs, none is more certain or noble than that which is drawn from *fruits*. For fruits and works stand as sponsors and sureties for the truth of Philosophies. And from these Philosophies of the Greeks, and their ramifications through particular Sciences, now, after the lapse of so many years, scarcely one experiment can be adduced, which has for its object the relieving and assisting the condition of man, and which can be reckoned as really received from the speculations and dogmas of Philosophy. And this Celsus ingenuously and prudently confesses : to wit, that medicines were first discovered by experiment, and that men afterwards philosophizing on them, traced out and assigned causes ; and that it did not happen by the inverse method that experiments themselves were discovered or derived from Philosophy and the knowledge of causes. And so it was not wonder-

ful that among the Egyptians, who paid divine honours and celebrated sacred rites in favour of inventors, there were more images of brute beasts than of men ; because brute beasts, by their natural instincts, have originated many discoveries, while men, from their discoveries and conclusions of reason, have produced few or none.

The industry of the chemists, indeed, has brought to light some few things ; but these have come as it were accidentally and by the way, or by some variation of experiments (as is the case with the mechanists), not from any art or theory, for their contrivances rather confuse experiments than assist them. The discoveries also of those who have practised natural magic, as they call it, are found to be few, and those worthless and rather akin to imposture. Wherefore the rule, which in Religion bids us show our faith by our works, may with great propriety be transferred to Philosophy ; viz. that it should be judged by its fruits, and be pronounced empty if it be barren ; and the more so if, in place of fruits of grape and olive, it produce the thistles and thorns of disputations and contentions.

lxxiv. Signs are also to be drawn from the increase and progress of Philosophies and Sciences. For what is founded on Nature grows and increases, while what is founded on opinion varies, but does not increase. And so, if these doctrines had not clearly been like plants pulled up by the roots, but had adhered to the womb of Nature, and been nourished by her, that would never had occurred which we see has been going on now for two thousand years ; namely, that the Sciences stand still and remain in nearly the same state ; and have never gained any increase worth mentioning, but have rather thriven most under their first author, and thenceforth declined : whereas in the Mechanical Arts, which are founded on Nature and the light of Experience, we see the contrary come to pass ; for they (as long as they please) are continually growing and increasing, as if filled with a kind of life, being at first rude, then convenient, afterwards refined, and always on the advance.

lxxv. Again, there is another Sign to be gathered ; (if, indeed, it has a right to the title of sign, when it should properly be called testimony, and that of all testimonies the most valid), we refer to the peculiar confession of the Authorities whom men now-a-days follow. For even they who dogmatize with so great confidence on things do yet, when they return to themselves, betake themselves to complaints concerning the subtlety of Nature, the obscurity of things, and the infirmity of human wit. Now, if they simply did this, they might perhaps deter the more timid from further inquiry, and yet quicken and incite others of a more active and confident disposition to a further advance. But these men are not satisfied with making confession for themselves, but they set down whatever is unknown or unattained by themselves or their masters as beyond the limits of possibility ; and, as if on the authority of their art, declare that it is impossible to be known or done, most presumptuously and invidiously turning the imperfection of their own discoveries into a libel on Nature herself, and the despair of every one else. Hence the School of the New

Academy, which professedly held Acatalepsy, and condemned men to everlasting darkness. Hence the opinion that it is impossible, and beyond man's power, to discover forms, or the true differences of things (which are really laws of pure act). Hence those opinions on the active and operative side, that the Heat of the sun and of fire differ *toto genere*; lest, forsooth, men should think that they can themselves educe and form, by the operation of fire, anything like the results of Nature. Hence that idea that composition only is the work of man, and mixture that of Nature alone; lest, forsooth, men should expect from art any generation or transformation of natural bodies. And so, by this Sign, men will easily allow themselves to be persuaded not to mix up their fortunes and labours with dogmas which are not only despaired of, but even devoted to desperation.

lxxvi. Nor must we neglect the Sign that there was formerly among philosophers so great dissension, and so great a variety in the Schools themselves; a fact that sufficiently shows that the road from the Sense to the Intellect was not well constructed, since the same ground-work of Philosophy (that is to say, the Nature of things) was torn up and distracted into such vague and manifold errors. And although in these times dissensions and diversities of opinions on first principles and entire systems of Philosophy are for the most part extinct, yet about parts of that Philosophy there remain innumerable questions and controversies; so that it plainly appears that neither in the systems of Philosophy themselves nor in the methods of Demonstration is there anything certain or sound.

lxxvii. And as to the opinion that in the Philosophy of Aristotle there is certainly great consent, since after its promulgation the Philosophies of the ancients ceased and became obsolete, while in the times which followed nothing better was discovered; so that it seems to have been so well laid down and founded as to have drawn both ages to itself: we reply, in the first place, that the popular notion of the falling into abeyance of the ancient Philosophies, on the publication of Aristotle's works, is a false one, for the works of the older philosophers remained a long while afterwards, even to the time of Cicero and the ages following. But, in the times which ensued, when human learning had, so to speak, suffered shipwreck in the inundation of the Roman Empire by the barbarians, then the Philosophies of Aristotle and Plato, like planks of a lighter and less solid material, were preserved on the waves of time. Moreover that notion of consent deceives men, as they would see if they only looked a little more sharply into the matter. For true consent is that which consists in the coming of unfettered judgments to the same conclusions (the matter having been previously investigated). But by far the greatest number of those who have consented to the Philosophy of Aristotle have enslaved themselves to it from prejudice and the authority of others, so that theirs is rather obsequiousness and concurrence than consent: but even if it had been real and widespread consent, so little right has consent to be received as a true and solid authority, that it even involves a violent presumption in the opposite direction. For

the worst of all auguries is that which is drawn from agreement in intellectual matters, with the exception of Divinity and Politics, in which suffrages have lawful weight. For nothing pleases the many which does not strike the imagination or bind up the intellect in the tangles of common conceptions, as we have said above. And so that saying of Phocion may very well be transferred from moral to intellectual matter, "That men ought straightway to examine themselves as to what mistake or fault they have committed, if the multitude agree with and applaud them." This Sign, therefore, is one of the most hostile. So we have here pointed out how weak are the Signs of the truth and soundness of the systems of Philosophy and the Sciences now in vogue, whether they be drawn from their origin, from their fruits, from their progress, from the confessions of their authors, or from consent.

Ixxviii. But now we must come to the Causes of errors, and of so long a persistence in them through so many ages. And these are so very numerous and powerful, as to remove all grounds for surprise that those observations which we bring forward should have hitherto lain hid and escaped men's notice; and it only remains for us to wonder that these things could, even thus late in the day, have entered into the mind of any mortal, or have afforded him matter for thought: and this, as we think, is rather the result of some happy chance than of any excellence of faculty in ourselves, so that it should be regarded as the offspring rather of time than of ability.

And first, the number of ages, if we consider the matter justly, shrinks within very narrow bounds. For out of the twenty-five centuries over which the memory and learning of mankind principally range, scarcely six can be picked out and set apart as having been fruitful in Sciences, or favourable to their progress. There are deserts and waste grounds in time, no less than in space; for not more than three revolutions and periods of learning can properly be counted: one among the Greeks; the second among the Romans; the last among ourselves—that is to say, the nations of Western Europe: and to each of these we can scarcely with fairness assign more than two centuries: The intervening ages of the world, as regards a rich or flourishing growth of the Sciences, were unfortunate. For there is no need to mention either the Arabs or the Schoolmen, who, in the intervals, rather wore down the Sciences with their numerous treatises, than increased their weight. So, the first cause of so trifling an advance in the Sciences is rightly and duly referred to the narrow limits of the time that has been favourable to them.

Ixxix. In the second place, a Cause offers itself which is in every way of great moment; viz., that in those very ages in which human wit and literature have flourished most, or even in a moderate degree, Natural Philosophy has obtained a very small share of attention. And yet this same Natural Philosophy ought to be regarded as the great mother of Sciences. For all the Arts and Sciences, if torn from this root, are polished, it may be, and fashioned into use, but do not grow at all. Now, it is manifest that after the Christian Religion had been

generally received and come to maturity, by far the greatest proportion of the most able minds betook themselves to Theology ; that to this pursuit were the greatest rewards proposed, and aids of every kind most plentifully afforded ; and that this zeal for Theology chiefly occupied that third portion or period of time among us inhabitants of Western Europe ; the more so, because about the same time both literature began to flourish and controversies about Religion to spring up. But in the preceding age, during the continuance of that second period among the Romans, the meditations and industry of the most influential philosophers were occupied and consumed on Moral Philosophy (which stood to the Heathens in the place of Theology), and at the same time the greatest wits of those days applied themselves very closely to civil affairs, on account of the magnitude of the Roman Empire, which needed the services of a great number of men. But that age, in which Natural Philosophy seemed most to flourish among the Greeks, was but a very short-enduring particle of time ; since in the earlier ages those seven, who were called "the Wise," all (except Thales) applied themselves to Moral Philosophy and Civil Matters ; and in later times, when Socrates had brought down Philosophy from heaven to earth, Morals obtained a still stronger hold, and turned men's minds away from Natural Philosophy.

Nay, that very period itself, in which inquiries concerning Nature flourished, was corrupted by contradictions and the ambitious display of new theories, and rendered useless. And so, inasmuch as during these three periods Natural Philosophy was in a great measure either neglected or hindered, it is no wonder that men made but little progress in a matter to which they paid no attention.

lxxx. And to this it may be added that Natural Philosophy, among those very men who have devoted themselves to it, has scarcely ever found, especially in these later times, any one at leisure and able to give it his whole attention, unless, perhaps, we bring forward the example of some monk studying in his cell, or some noble in his country house. But it has been made to serve as a sort of passage and bridge to other subjects. And that great mother of Sciences has, with strange indignity, been degraded to the services of a menial, having to minister to the business of Medicine and Mathematics, and again to wash and imbue the unripe wits of young men with a sort of first dye, that they may afterwards receive another more successfully and conveniently. In the mean time, let no one expect any great advance in the Sciences (especially in the practical part of them) until Natural Philosophy shall have been extended to particular Sciences, and the particular Sciences brought back again to Natural Philosophy. For hence it arises that Astronomy, Optics, Music, most of the Mechanical Arts, Medicine itself, and (what one might more wonder at) Moral and Civil Philosophy, and the Logical Sciences, have scarcely any depth, but only glide over the surface and variety of things ; because, after these particular Sciences have been distributed and established, they are no longer fed by Natural Philosophy ; which might have imparted to them new strength and growth from the

sources and true contemplations of motions, rays, sounds, textures and structures of bodies, affections, and apprehensions of the Intellect. And so it is very little marvel if the Sciences do not grow, since they are separated from their roots.

lxxx. Again, there appears another potent and weighty cause why the Sciences have made but little advance. And it is this: it is impossible to proceed rightly in the course when the goal itself is not rightly placed and fixed. Now, the true and legitimate goal of the Sciences is none other than this, to endow human life with new discoveries and resources. But the great mass of men feel nothing of this, but merely work for reward and professionally; unless, perhaps, it sometimes happens that some artificer of a sharper wit, and desirous of fame, gives his labour to some new invention; which is generally done at the expense of his property. But as for most men, so far are they from proposing to themselves to obtain an addition to the mass of Sciences and Arts, that from the mass which is at hand they take and search for nothing more than they can turn to their professional ends, or to gain, or to reputation, or to advantages of that kind. And if there be any one out of so great a multitude who seeks out Science from a sincere affection and for its own sake, still even he will be found to aim at a variety of contemplations and teachings, rather than a severe and rigid inquiry after truth. Again, if any one happen to be a stricter searcher after truth, yet even he will propose to himself such a condition of truth as may satisfy his mind and intellect in rendering causes for things known long ago, and not one which may attain new assurances of results, and a new light of Axioms; if, then, the end of knowledge has not hitherto been rightly laid down by any one, it is not strange that error ensues in what is subordinate to the end.

lxxxii. And as men have misplaced the end and goal of the Sciences, so again, even if it had been rightly placed, yet they have chosen for themselves a way entirely erroneous and impassable. And it will strike with astonishment the mind of any one who rightly considers the matter, that no one has had the care or the heart to open and lay out for the human Intellect a rightly-ordered and well-constructed way from actual sense and experience, but that all has been left either to the darkness of traditions, or to the whirl and eddy of arguments, or to the fluctuations and windings of chance and of vague and ill-digested experience. Now, let any one consider, soberly and diligently, what sort of a way it is which men have been wont to adopt in the investigation and discovery of any matter; and he will first remark, no doubt, the simple and unworkmanlike character of the method which is most common among us. It is simply this, that when a man proposes and addresses himself to discover anything, he first inquires and unfolds what has been said about it by others; then he adds his own reflections, and with much agitation of mind solicits and, as it were, invokes his own spirit to open its oracles to him—a proceeding altogether without foundation, and completely dependent upon opinions.

And another may call in Logic to aid in discovery, but it has nothing to do with the matter in hand, except in name. For Logic does not set herself to discover Principles and chief Axioms, of which the Arts are composed, but only those things which appear to agree with them. For Logic, rendering her well-known answer to the curious, the importunate, the busy-body, and those who question her about proofs and discoveries of Principles or first Axioms, sends them back to the faith which duty pledges them to render to each individual art.

Simple Experience remains, which, if it meets us unsought, is called Chance ; if it be sought for, Experiment. But this kind of Experience is nothing better than "an unbound besom," as they say, and a mere feeling, as of men in the night trying all around for the chance of falling into the right way ; whereas it would be much better and more considerate to wait for day, or to light a lamp, and then to enter upon the journey. But, on the other hand, the true order of Experience is first to light a lamp, and then, by means of the lamp, to point out the road, beginning from a well-ordered and digested Experience, the opposite of what is out of place or erratic ; and from it educing Axioms, and from the Axioms, when established, again new experiments, since not even the Divine Word operated on the mass of things without order.

And so men may cease to wonder that the course of the Sciences is not accomplished, since they have wandered altogether from the way, entirely leaving and deserting Experience, or else losing themselves and wandering about in it as in a labyrinth ; while a rightly-constituted order would lead them, by a continuous path, through the forests of Experience to the open lands of Axioms.

lxxxiii. Now, that disease has grown wonderfully out of a certain opinion or conceit, which, though long established, is vain and injurious, namely, that the majesty of the human mind is impaired by long and frequent employment upon experiments and particulars which are subject to the sense and determinate in matter ; especially as subjects of this kind are usually laborious to inquire into, ignoble to meditate on, harsh to speak, illiberal to practice, infinite in number, and refined in their subtlety. And so now at last the matter has come to this, that the true way is not only deserted, but also shut up and obstructed, Experience being not only abandoned or badly administered, but absolutely disdained.

lxxxiv. Again, a reverence for antiquity and the authority of men esteemed great in Philosophy, and then consent, have held back men from advancing in knowledge, and almost fascinated them. And concerning consent we have spoken above.

But the opinion which men cherish about antiquity is altogether slovenly, and scarcely corresponds to the word. For the old age and long duration of the world are really to be taken as antiquity ; but these are the attributes of our own times, and not of the more youthful age of the world, as it existed among the ancients. For that age, though in respect of us it is ancient and older, in respect of the world

itself is modern and younger. And truly, as we expect a greater knowledge of human affairs and a riper judgment from an old man than from a young one, on account of his experience and of the variety and abundance of the things which he has seen and heard and thought upon, so in like manner also from our age (if it knew its own strength, and chose to essay and exert it) it is fair to expect far greater things than from the earlier times, inasmuch as the age of the world is greater, and has been enriched and stored by an infinite number of experiments and observations.

Nor is it to be counted as nothing, that by means of distant voyages and travels, which have been frequent in our generation, very many things in Nature have been laid open and discovered which may let in a new light upon Philosophy. And really it would be disgraceful to mankind if the regions of the material globe, viz., of the earth, of the sea, and of the stars, should in our times be laid open and illustrated to a very great extent, and yet the limits of the intellectual globe be confined to the narrow discoveries of the ancients.

But with regard to authority, it is a mark of the greatest weakness to assign unbounded influence to authors, while we deny its rights to time, the author of all authors, and so of all authority. For truth is rightly called the daughter of time, and not of authority; and so it is not wonderful if these enchantments of antiquity, authority, and consent have so bound up the strength of men, that they have not been able (being as it were bewitched) to hold familiar intercourse with things themselves.

lxxxv. Nor is it only the admiration of antiquity, authority, and consent, which has compelled the industry of mankind to rest contented with what is already discovered, but also an admiration of the results themselves, of which the human race has long had a plentiful supply. For when any one has brought within his view the variety of things, and the very beautiful apparatus which has been collected and introduced for the improvement of mankind by means of the Mechanical Arts, he will certainly be inclined rather to admire the wealth of man than to feel his poverty, never reflecting that the primitive observations of man, and the operations of Nature (which are the life and original causes of all that variety), are neither many in number, nor fought from any depth; that the rest is due to the patience of men only, and to the subtle and well-directed motion of hand or instruments. For, to take an example, watch-making is a subtle and exact business, inasmuch as it seems to imitate the motions of the heavenly bodies by means of wheels, and the pulse of animals by its successive and orderly motion; and yet the whole thing depends on one or two axioms of Nature.

If, again, any one looks into the subtlety which pervades the Liberal Arts, or even that which exists in the preparation of natural bodies by the Mechanical Arts, and takes in hand subjects of this sort: such as the discovery of the celestial motions in astronomy, of harmony in music, of letters of the alphabet (which even up to the present time are not in use in the Chinese Empire) in grammar; or

again, in mechanics, or in what is mechanical, the doings of Bacchus and Ceres, *i.e.*, the preparation of wine and beer, the making of bread ; or even the delicacies of the table, distillation, and the like ; he will also, if he reflects and considers what long revolutions of time (for all these things, with the exception of distillation, are ancient) it has taken to bring these things to their present state of perfection, and (as we have just said of clocks) how little they draw from observations and axioms of Nature, and how easily and, as it were, by chance occurrences and casual contemplation they might have been discovered—he, I say, will easily dismiss all wonder, and rather pity the condition of mankind for its long-continued dearth and barrenness of facts and inventions. And yet these very discoveries which we have now mentioned are more ancient than Philosophy and the arts of the Intellect ; so that (to speak truth) the discovery of useful results ceased when rational and dogmatic Sciences of this kind began.

But if we turn from manufactories to libraries, and feel astonishment at the immense variety of books which we see there, let us only examine and diligently inspect the matter and contents of the books themselves, and our astonishment will certainly be turned in the opposite direction ; and when we have observed the ceaseless repetitions, and seen how men do and say the same things, we shall pass from admiration of the variety to marvel at the poverty and scantiness of those things which have hitherto held and occupied men's minds.

But if we condescend to the consideration of those things which are held to be more curious than sound, and examine closely the works of the alchemists or magicians, we shall perhaps hesitate whether they be worthy of laughter or of tears. For the Alchemist cherishes eternal hope ; and when his work does not succeed, shifts the blame on to his own mistakes, accusing himself of not having sufficiently understood the words of his art or of his authors ; upon which he turns his mind to tradition and muttered whispers, or thinks that in his manipulation he has made some blunder of a scruple in weight, or a moment in time ; wherefore he repeats his experiments to infinity : and when, in the mean time, among the chances of experiment he lights upon some things which are either novel in their appearance, or on account of their utility not to be despised, he feasts his mind upon them as pledges of what is to come, raises them into still greater estimation, and supplies the rest with hope. Yet we cannot deny that the Alchemists have made many discoveries, and have presented mankind with useful inventions. But we may well apply to them that fable of the old man, who bequeathed to his sons some gold buried in a vineyard, pretending that he did not know the spot, whereupon they set themselves diligently to dig the vineyard, and though no gold was found, yet the vintage was made richer by that culture.

But the cultivators of Natural Magic, who explain everything by sympathies and antipathies, out of idle and most slothful conjectures have fabricated for things marvellous powers and operations : but if they have ever produced any results, they have been such as tended to the wonderful and the novel, and not to fruit and utility.

In superstitious Magic, on the other hand (if indeed we need speak about that), we must especially observe, that it is only subjects of a fixed and definite kind that the curious and superstitious arts, in all nations and ages, and even religions, have either worked or played. We may therefore dismiss them. In the mean time we cannot wonder if a notion of plenty should have caused want.

lxxxvi. And the wonder of mankind as regard Doctrines and Arts, of itself sufficiently simple, and almost childish, has been increased by the craft and artifices of those who have treated of Sciences and handed them down. For they set them forth in their ambition and affectation, and bring them to the view of mankind so fashioned and masked, as if they were in every respect perfect, and carried through to their end. For if you consider their method and divisions, they appear to embrace and include all things which can fall within the subject. And though these limbs are badly filled, and like empty bladders, still they present to the vulgar understanding the form and plan of a perfect Science.

But the first and most ancient seekers of truth, with greater honesty and good fortune, were wont to throw that knowledge which they meant to cull from the contemplation of things, and to lay by for use, into Aphorisms, or short scattered sentences, without methodical connection; nor did they pretend to profess to embrace universal Art. But as things are now managed, it is very little to be wondered, that men do not search further into these matters, since they are handed down as perfect, and long since completed.

lxxxvii. Moreover, the ancient systems have received much additional consideration and credit from the vanity and levity of those who have set forth new ones, especially in the active and operative parts of Natural Philosophy. For there have not been wanting vain talking and fantastical men, who, half credulous and half impostors, have loaded mankind with promises, promising and proclaiming prolongation of life, postponement of old age, alleviation of pain, repairing of natural defects, deception of the senses, the controlling and the compelling of the affections, illumination and exaltation of the intellectual powers, transmutation of substances, the strengthening and multiplication of motions of will, impressions and alterations of the air, the drawing down and procuring celestial influences, divinations of future events, the bringing near what is distant, the revealing what is hidden, and very many other things. But one would not be far wrong in passing some such judgment as this on those liberal men, viz., that in the teachings of Philosophy, there is as great a difference between their vanities and true Arts, as there is in history between the exploits of Julius Cæsar or Alexander the Great, and those of Amadis de Gaul, or Arthur of Britain. For those very famous generals are found to have performed greater exploits in reality than these shadowy heroes have done even in fiction, but by means and ways of action not at all fabulous or monstrous. Yet it is not fair to impugn the credit of a true relation because it has sometimes been injured and wronged by fables. In the mean time it is by

no means strange that a great prejudice should be caused against new propositions (especially when accompanied by allusion to results) on account of those impostors who have attempted the like ; since their excessive vanity and fastidiousness have, even in the present day, destroyed all greatness of mind in attempts of this kind.

lxxxviii. But far greater injury has been inflicted on the Sciences by meanness of spirit, and the smallness and lightness of the tasks which human industry has proposed to itself. And yet (which is worst of all) that meanness of spirit does not present itself without arrogance and disdain.

For, first, we find, in connection with all Arts, the caution, already familiar to us, with which the authors turn the weakness of their several Arts into a charge against Nature ; and that when a thing is not attainable by their Art, they pronounce it, on the authority of that same Art, to be impossible in Nature. And certainly Art cannot be condemned if she be her own judge. Indeed, the Philosophy, at present in vogue, cherishes in her breast certain positions or opinions, the object of which is (if a diligent inquiry be made) to persuade men that nothing difficult, or involving power and influence over Nature, ought to be expected from Art, or the operation of man ; as was said above with respect to the heterogeny of Heat when derived from sidereal bodies or from fire, and concerning Mixture. But if these things be accurately noted, they are found to tend entirely to a wilful circumscription of human power, and to a contrived and factitious despair ; which not only disturbs the auguries of hope, but also cuts into all the spurs and sinews of industry, and rejects the chances of Experience herself ; and all to the end that their Art may be thought perfect, and that they may enjoy the most empty and pernicious boast—that whatever has been hitherto undiscovered or uncomprehended is altogether beyond the possibility of discovery and comprehension for the future. And if any one tries to set himself to work, and to make some new discovery, still he will absolutely propose and appoint to himself to investigate and bring out some single discovery, and no more : as the nature of the magnet, the flowing and ebbing of the sea, the system of the heavens, and things of this kind, which seem to have something secret about them, and have not been happily treated of hitherto. Whereas it is a mark of extreme unskilfulness to investigate the nature of anything in the thing itself, inasmuch as the same Nature which in some things seems to be latent and hidden, in others is manifest and, as it were, tangible ; in the former cases exciting admiration, in the latter not even common attention. As happens in the nature of “Consistency,” which is not marked in wood or stone, but is passed over under the name of solidity, without any further inquiry being made as to the repulsion of separation, or the solution of continuity ; whereas in the case of bubbles of water the same thing seems subtle and ingenious, the bubbles throwing themselves into certain pellicles, curiously fashioned into the shape of a hemisphere, so that for a moment the solution of continuity is avoided.

And certainly those same things which are regarded as secret have

in other cases a manifest and a common nature ; but it will never become visible, if the experiments or contemplations of men are engaged on those same things exclusively. But generally and commonly in Mechanics, old discoveries are esteemed new, when any one refines upon or embellishes things which have been long ago discovered, or unites and compounds them, or connects them more conveniently with their application, or produces the result in greater or even less mass and volume than usual, and the like.

And so it is very little wonder if discoveries, noble and worthy of mankind, have not been brought to light, how men have been contented and delighted with slight and peurile tasks of this kind, and have thought, moreover, that in them they have aimed at or obtained something great.

LXXXIX. Nor is the fact to be passed by, that Natural Philosophy has in all ages found a troublesome and difficult enemy : I mean superstition, and a blind and immoderate zeal about Religion. For we may see among the Greeks how they who first proposed the natural causes of lightning and tempests to the then unprepared ears of men, were on that account found guilty of impiety towards the Gods ; nor were those much better treated by some of the ancient Fathers of the Christian Religion, who, from the most certain demonstrations (which at the present day no one in his senses contradicts) laid down that the world is round, and, as a consequence, asserted the existence of Antipodes.

Moreover, as things are now, the discoursing on Nature is made harder and more dangerous by the summaries and methods of the scholastic Theologians, who, not contented with having reduced Theology (as far as they were able) to order, and fashioning it into an Art, have further contrived to mix up the disputations and thorny Philosophy of Aristotle with the body of Religion in an inordinate degree.

In the same direction (though in a different way) tend the speculations of those who have not feared to deduce the truth of the Christian Religion from the principles of Philosophers, and to confirm it by their authority, celebrating the union of Faith and sense, as if it were a legitimate marriage, with much pomp and solemnity ; and soothing the minds of men with a pleasing variety of things, but in the mean time mixing up the divine with the human element in a most unfitting manner. Now, in such mixtures of Theology with Philosophy, those things only are comprehended which are now received in Philosophy, while novelties, although they are changes for the better, are all but removed and exterminated.

Lastly, you may find that, owing to the want of skill of certain Theologians, the approach to any Philosophy, however corrected, is almost closed. Some, indeed, in their simplicity, are half afraid, lest perchance too deep an inquiry into Nature should penetrate beyond the permitted limits of sobriety ; falsely transferring and wresting what is spoken in Holy Scripture of Divine mysteries against those who pry into the Divine secrets, to the hidden things of Nature,

which are prohibited by no such law. Others, with greater cunning, consider and reflect that if intermediate causes be unknown, each occurrence can be more easily referred to the Divine hand and rod (which they consider to be of great importance in Religion); which is nothing else but seeking to "gratify God by a lie." Others fear, from what has already happened, that the movements and changes of Philosophy may end by assaulting Religion. Others, again, seem anxious lest anything should be discovered during the investigation of Nature which may subvert Religion (especially among the unlearned), or at least shake its authority. But these two last fears seem to us to savour altogether of a carnal wisdom; as if men, in the recesses of their minds, and in their secret thoughts, distrusted and doubted the stability of Religion, and the empire of Faith over Sense; and therefore feared that danger threatened from the inquiry after truth in natural things. But, if we take the true view of the matter, Natural Philosophy is, next to the Word of God, the most sure remedy for superstition, and at the same time the most approved nourishment for Faith. And so she is rightly given to Religion as a most faithful handmaid; the one manifesting the will of God, the other His power. Nor was He wrong who said: "Ye do err, not knowing the Scriptures, and the power of God;" thus joining and coupling information concerning His will, and meditation on His power, in an inseparable bond. In the mean while it is the less strange, that the growth of Natural Philosophy is restrained, seeing that Religion, which has very great influence over the minds of men, has, through the unskilfulness and incautious zeal of certain persons, crossed over and been carried into opposition.

xc. Again, in the customs and institutions of schools, academies, colleges, and similar places of resort, set apart as the abodes of learned men, and for the cultivation of erudition, everything is found to be hostile to the progress of knowledge. For lectures and exercises are so disposed, that it does not easily occur to any one to think or meditate on anything out of the customary routine. And if one or two have perchance the boldness to exercise liberty of judgment, they must undertake the task by themselves, for they will gain no advantage from union with others. And if they can endure this, still they will find their industry and liberality no slight impediment in reaching fortune. For the pursuits of men in places of this kind are confined to the writings of certain authors, as if they were prisons; and if any one dissents from them, he is straightway seized upon as a turbulent man, and one desirous of innovations. But surely there is a great distinction between civil matters and the Arts, for the danger from a new movement and from a new light is not the same. In civil matters, a change even for the better is suspected as the probable cause of disturbance; since civil matters rest on authority, consent, report, and opinion, not on demonstration. But in the Arts and Sciences, as in mines, all around ought to echo with the sound of new works and further progress. And such is the case according to right reason; but meanwhile it is not carried out in practice; that adminis-

tration and polity of learning, of which we have spoken, having usually pressed too harshly upon the growth of the Sciences.

xc. And besides, supposing this objection to have ceased, still it is enough to restrain the growth of the Sciences, that industrious attempts of this kind have no reward. For the prizes of Science are not in the hands of its cultivators. The increase of the Sciences proceeds from great abilities ; but their prizes and rewards are in the hands of the vulgar or of great men, who (with a very few exceptions) have an indifferent stock of learning. And further, progress of this kind is destitute, not only of rewards and benefits, but even of popular praise : for it is above the grasp of the greatest part of mankind, and is easily overwhelmed and extinguished by the gales of public opinion. And so it is not to be wondered that an undertaking does not end prosperously which is not held in honour.

xcii. But by far the greatest obstacle to the progress of the Sciences, and to the undertaking new tasks and provinces therein, is found in the tendency of man to despair, and to suppose things impossible. For prudent and strict men are accustomed, in matters of this kind, to be thoroughly distrustful, bearing in mind the obscurity of Nature, the shortness of life, the fallacies of the senses, the infirmity of judgment, the difficulty of experiments, and the like. And so they think that the Sciences ebb and flow in the revolutions of time and of the ages of the world ; at some seasons increasing and flourishing, at others declining and fading away ; yet in such a way, that, when they have arrived at a certain degree and standing, they can go no further.

And so, if any one believes or promises any greater result, they think it proceeds from a weak and unripe mind, and believe that attempts of this kind, though they have prosperous beginnings, are of difficult continuance and end confusedly. And since thoughts of this kind easily present themselves to men of gravity and superior judgment, care must really be taken that we be not smitten with the desire of something very good and beautiful, and so relax or diminish the stringency of our judgment ; we must look sedulously what gleams of hope there may be, and from what quarter they show themselves ; and must, rejecting the lighter aspirations of hope, review and weigh those which seem to have more solidity. Moreover, civil prudence must be summoned and brought to counsel, which is distrustful by prescription, and takes the worst view of human affairs. And so we must now also speak concerning hope, especially as we are not vain promisers, and do not aim at forcing or ensnaring men's judgments, but wish to lead them by the hand, and with their own content. And although by far the most potent means of impressing hope will come into play when we bring men to particulars, especially as digested and set in order in our Tables of Discovery (which belong partly to the second, but much more to the fourth part of our Instauration) ; since this is not hope simply, but, as it were, the thing itself ; yet, that all may be done gently, we must proceed in our plan of preparing men's minds, of which preparation that exhibition of hope constitutes no trifling part. For without it the rest rather causes men to despond (that is to say,

to have a worse and lower opinion of existing things than they now have, and to feel and understand more thoroughly their own unfortunate condition) than excites any alacrity in them, or incites their industry in making experiments. And so we must open out and set forth our conjectures as to what makes hope in this matter probable ; as Columbus did, before that wonderful voyage of his across the Atlantic, when he adduced reasons for his confidence that new lands and continents might be discovered in addition to those already known ; which reasons, though at first rejected, were yet afterwards proved by experiment, and were the cause and beginning of very great events.

xciii. And we must begin from God ; proving that the business in hand, on account of the nature of good which prevails in it, is manifestly from God, who is the Author of good and Father of lights. Now, in Divine operations the very slightest beginnings of a certainty bring after them a result ; and what has been said of spiritual things, "The kingdom of God cometh not with observation," is also found to apply in all the greater works of Providence ; everything glides quietly past, without noise or sound, and the matter is actually accomplished before men think or perceive that it is being accomplished. Nor must we omit the prophecy of Daniel concerning the latter times of the world : "Many shall run to and fro, and knowledge shall be increased ;" clearly hinting and signifying that it is the will of Fate (*i.e.* of Providence) that the thorough exploration of the world (which seems by so many distant voyages to be fulfilled, or to be even now in the course of fulfilment) and the advance of the Sciences, should fall in the same age.

xciv. Now follows the strongest reason of all for encouraging hope : that, we mean, which is drawn from the mistakes of past times, and of the ways hitherto attempted. For that was a very good reproof which some one delivered to a commonwealth which was unwisely administered, "That which was the worst thing in the past should be looked upon as the best augury for the future. For if you had fulfilled all that your duty required, and yet your affairs were in no better position, not the least hope would be left of any further improvement. But since the present position of your affairs is owing, not to the absolute force of circumstances, but to your own mistakes, it is to be hoped that, when these mistakes shall have been discontinued or corrected, a great change may be made for the better." In like manner, if men, during the course of so many years, had kept to the true way of discovering and cultivating the Sciences, and yet had not been able to advance further, the opinion that further progress was impossible would beyond doubt be bold and rash. But if the mistake has lain in the way itself, and men's labour has been wasted in matters with which it should never have been engaged ; then it follows that the difficulty arises, not in things themselves which are beyond our power, but in the human Intellect, its use and application—an evil which admits of remedy and cure. And so it will be a very great thing to set forth these same errors, since every impediment arising from

errors in times past becomes an argument for hope in the future. And although these have not been left altogether unnoticed in what has been said above, still it seems good to represent them now again briefly, in plain and simple language.

xcv. Those who have treated of the Sciences have been either Empirics or Dogmatists. The Empirics are like the ant, they only bring together and use ; the Rationalists are like spiders, which spin webs out of their own bowels ; but the bee follows a middle course, for she draws her materials from the flowers of the garden and the field, and yet changes and digests them by a power of her own. Nor is the true process of philosophy unlike this, for it does not rely either exclusively or principally on the strength of the mind, nor does it lay up in the memory materials supplied from Natural History and Mechanical experiments in their raw state, but stores them in the intellect, after having altered and digested them. And so, from a closer and more religious union of these faculties (*viz.*, the experimental and the rational) than has yet been effected, great hopes may be entertained.

xcvi. Natural Philosophy is not yet found to be sincere, but is infected and corrupted : in the school of Aristotle, by Logic ; in the school of Plato, by Natural Theology ; in the second school of Plato, that of Proclus and others, by Mathematics, which ought to limit Natural Philosophy, and not generate or originate it. But from a Natural Philosophy, pure and unmixed, better things are to be hoped.

xcvii. No one has been as yet found possessed of sufficient constancy and fixedness of character to determine and take upon himself the utter abolition of theories and common notions, and the application afresh to particulars of an intellect purified and impartial. And so that human reason which we possess is a sort of farrago and congeries of much credulity and much accident, not to speak of the childish fancies which we imbibed at first.

But if any one of ripe age, unimpaired senses, and purified mind, would apply himself to Experience and to Particulars anew, better hopes might be entertained of him. And herein we promise ourselves the fortune of Alexander the Great ; and let no one charge us with vanity before he hears the result, which has in view the putting off of all vanity.

For concerning Alexander and his exploits *Æschines* spoke thus : " We certainly do not live the life of mortal men, but are born to the end that posterity may relate and declare wonders concerning us." As if he considered the exploits of Alexander miraculous.

But in a following age *T. Livius* took a truer view of the matter, and said of Alexander something of this kind : " That he had done nothing but nobly dare to condemn what was vain." And we imagine that a like judgment will be passed on us in future times : " That we have done nothing great, but have only made less account of those things which are held to be great." But in the mean time (as we have already said) there is no hope save in the regeneration of the Sciences ;

they must be raised in due order from Experience, and built up anew ; and no one, we imagine, will venture to affirm that this has been hitherto done, or even thought of.

xcviii. And the grounds of Experience (for we must always come down to this) either do not exist, or have as yet been very weak ; nor has there yet been any search made after a store or collection of particulars, fit either in number, in kind, or in certainty, to form the Intellect, or in any way sufficient. On the contrary, men of learning (but supine and easy) have taken up, for the construction and constitution of their Philosophy, certain rumours, and, as it were, reports and breezes of Experience, and have allowed to them the weight of legitimate testimony. And just as if some kingdom or state were to direct its counsels and business not by the letters and reports of its ambassadors and trustworthy messengers, but by the gossip of citizens and tattle from the streets, so in all respects has been the management introduced into Philosophy, as far as regards Experience. Nothing duly inquired into, nothing verified, nothing counted, nothing weighed, nothing measured, is found in Natural History. But that which in observation is indefinite and vague, is in information fallacious and untrustworthy. And if these statements seem to any one strange, and bordering on injustice, since Aristotle, a man so great in himself, and supported by the riches of so great a king, completed so accurate a history of animals ; and some others, with greater diligence, though with less noise, have made many additions thereto ; and others, again, have composed copious histories and relations of plants, metals, and fossils ; he really does not seem sufficiently to attend to and to discern the business in hand. For there is one kind of Natural History which is composed for its own sake ; another which is collected to inform the Intellect, with a view to the construction of a Philosophy. And these two histories, among many points of difference, possess this principal one, that the first contains the variety of natural species, and not the Experiments of the Mechanical Arts. For as in civil matters the ability of each man, and the secret bias of his mind and affections are best elicited in times of trouble ; so the secrets of Nature reveal themselves better under the vexations of the Arts than when they wander on in their own course. And so, then, there will be grounds of hope for Natural Philosophy when Natural History (which is its base and foundation) has been better arranged, but not till then.

xcix. And again, in the very abundance of Mechanical Experiments is disclosed the extreme scarcity of those which most aid the information of the Intellect. For the mechanic, not at all anxious about the investigation of truth, will not raise his mind or stretch out his hand to anything that does not help on his own work. But hope of the further progress of the Sciences will be well founded when there shall be admitted and gathered up into Natural History very many Experiments, which, though of no use in themselves, do so much towards the discovery of causes and Axioms ; and these we have been wont to call "light-bearing" Experiments, to distinguish them from those that are "fruit-bearing." For they have in them a wonderful virtue and

condition, namely, that they never deceive or fall short. For as they are applied not for the purpose of producing any result, but only of unfolding some natural cause, they equally satisfy our intention, in whatever way they turn out, by putting an end to the inquiry.

c. But not only is a greater abundance of Experiments to be sought for and procured, and that of a different kind from what has as yet been found, but also quite a different method, order, and process of continuing and carrying forward Experience, must be introduced. For vague Experience following only itself (as has been said above) is a mere groping, and rather stupefies men than informs them. But when Experience shall proceed by a certain law, in order and without interruption, we may hope something better of the Sciences.

ci. But when there is brought to hand and made ready such an abundant material for Natural History and Experience as is required for intellectual or philosophical operations, yet is the Intellect in nowise competent to act upon these materials spontaneously and by the aid of memory alone; no more than a man can hope by the aid of memory alone to retain and make himself master of the computation of an almanac. And yet up to this time meditation has had a greater share in discovery than writing, nor has Experience as yet been made literate; but no discovery can be satisfactory without writing. And when that comes into use, and Experience is at length made literate, better hopes may be entertained.

cii. And again, now that there is so great a number and, as it were, host of particulars, and these so scattered and diffused as to distract and confuse the Intellect, we cannot hope much from the skirmishing and light movements and sallies of the Intellect, unless there be an arrangement and reduction to order of those things which belong to the subject under inquiry, by means of suitable, well-disposed, and, as it were, living tables of discovery; and the mind be applied to the aids already prepared and digested which these tables give us.

ciii. But when the store of particulars has been in due order set before our eyes, we must not at once pass on to the investigation and discovery of new particulars and results, or, at least, if we do so, we must not rest there. For we do not deny that when all the Experiments of all the Arts have been collected and digested, and have been brought within the knowledge and judgment of one man, many new discoveries advantageous to man's life and condition may be made by transferring the Experiments of one Art to others, under the guidance of that very Experience which we call literate: yet small results are to be expected from so doing: but greater may be looked for from the new light of Axioms, which, being educed by a certain way and rule from these particulars themselves, shall again indicate and point out new particulars. For the road does not lie in a single plane, but ascends and descends; first ascending to Axioms, and then descending to Results.

civ. And yet the Intellect must not be allowed to leap and fly off from particulars to remote and, as it were, most general Axioms (such as the Principles, as they call them, of Arts and Things), and from their incontrovertible truth prove and work out middle Axioms; but

this is what has been done hitherto, the cause being the natural fondness of the Intellect for such a process, and its previous instruction and acquaintance with it by means of Syllogistic Demonstrations. But then only may good hopes be entertained of the Sciences when, by means of a true scale and continuous steps, without interruption or breaks, the ascent shall be made from particulars to lesser Axioms, and thence to intermediate ones, each rising above the other, and finally, at length, to the most general. For the lowest Axioms do not differ much from bare Experience, while those highest and most general (as they are considered) are arbitrary and abstract, and without solidity. But those middle Axioms are true, and solid, and living, and on them depend man's affairs and fortunes : and above these also, and last of all, come those which are most general ; such, we mean, as are not abstract, but are really limited by these middle ones.

So, then, we must not add wings to the human Intellect, but rather leaden weights, so far as to keep it from leaping and flying. And this has not been done hitherto ; but when it shall have been done we may have better hopes of the Sciences.

cv. Now in constructing an Axiom, a form of Induction differing from that hitherto in use must be thought out ; and that in order to prove and discover, not first principles, as they call them, alone, but also lesser, middle, and, in short, all kinds of Axioms. For the Induction which proceeds by simple enumeration is puerile, and concludes uncertainly, and is exposed to danger from a contradictory instance, and generally passes judgment from fewer instances than is right, and then from those only which are at hand. But the Induction, which shall be useful for discovery and demonstration, ought to separate Nature by due rejections and exclusions, and then, after a sufficient number of negatives, conclude upon the affirmatives ; but this has not yet been done, nor indeed attempted, save only by Plato, who indeed uses this form of Induction to a certain extent, for striking out definitions and ideas. And for the good and legitimate arrangement of this Induction or Demonstration, very many things must be applied which have as yet never entered into the thoughts of man ; so that greater labour has to be expended on it than has hitherto been spent upon the Syllogism. And this Induction must be employed, not only to discover Axioms, but also to determine Notions. And it is certain that in this *Induction* our principal hope lies.

cvi. But, in constructing Axioms by this Induction, we must also examine and try whether the Axiom under construction is only fitted and made to the measure of those particulars from which it is drawn, or whether it is of a wider and broader application. For if it be wider or broader, we must see whether it confirm that width and breadth, by designating new particulars, as a security that we shall not either remain stationary in what is known, or perhaps loosely grasp at shadows and abstract forms, instead of what is solid and defined in matter. And when those precautions shall have been adopted, then at length a substantial hope will have fairly dawned upon us.

cvii. And here, too, we must resume what has been said above of

the carrying forward of Natural Philosophy and the bringing back of particular Sciences to it, that the Sciences be not fevered or maimed ; for indeed without this there can be little hope of progress.

cvi. We have now spoken of the removal of despair, and the introduction of hope, as arising from the dismissal or rectification of past errors. And now we must look if there be any other causes for hope. And we light upon this : if many useful discoveries have been made by chance, as it were, or through the force of circumstances, by men who were not looking for them, or who were engaged on other pursuits, no one can doubt that if the same men do look for them, and make it their business to do so after a fixed method and order, and not by desultory impulses, they must necessarily discover much more. For although it may happen once or twice that a man may by chance light upon that which has heretofore escaped his laborious and industrious inquiry, yet in the long run the contrary is unquestionably found to be the case. And so far more numerous and better discoveries, and these at shorter intervals, are to be expected from the reason and industry, from the direct and intentional action of men, than from chance, animal instinct, and the like, which have hitherto originated discoveries.

cix. Hope may also be derived from the fact that some of those things which are already discovered are of such a kind as, previous to their discovery, would not have easily occurred to any one ; they would simply have been rejected as impossible. For men are accustomed to conjecture what is coming from the example of what is old, and in conformity with a fancy tutored and prejudiced thereby ; a most fallacious way of forming an opinion, since much that is sought from the fountain-head does not come through the accustomed channels.

For instance, if some one before the discovery of cannon had described the thing by its effects, and had spoken after this fashion : " A certain discovery has been made by which walls and the mightiest fortifications can be shaken and cast down at a great distance ; " men certainly would have begun to think of multiplying the powers of engines and machines by means of weights and wheels, by batteries and projectiles of a similar kind, in all manner of different ways : but it would scarcely have occurred to any one's imagination or fancy, to think of a fiery blast expanding and exploding in so sudden and violent a way ; for he would not have seen any example of such an action near him, unless perchance in the earthquake, or the lightning, which men would at once have rejected as great marvels of Nature, and not to be imitated by man.

In the same way, if, before the discovery of silk, some one had thus spoken : " A certain kind of thread has been discovered, fitted for clothing and furniture, which far exceeds linen or woollen thread in fineness, and at the same time in tenacity, brilliancy, and softness ; " men would at once have begun to think of some silky vegetable, or of the more delicate hairs of some animals, or of the feathers and down of birds ; but they certainly would never have thought of the web of a weak worm, and that so copious, self-renewing, and annually

productive. Nay, if any one had hinted a word about a worm, he would certainly have been ridiculed for dreaming about a new kind of cobweb.

In like manner, if, before the discovery of the mariner's compass, any one had declared that a certain instrument had been discovered by which the cardinal points of the heaven could be found and distinguished exactly, men would have immediately run off, in the excitement of their imagination, to a variety of conjectures as to the more exquisite construction of astronomical instruments ; but that anything should have been discovered corresponding so exactly in its motions to those of the heavenly bodies, and yet not a heavenly body itself, but only a stony or metallic substance, would have seemed altogether incredible. And yet these things, with others like them, lay concealed from men for so many ages of the world, and were not discovered by Philosophy or the arts of reason, but by chance and occasion ; and are, as we have said, altogether different in kind, and removed from anything already known, so that no preconceived notion could possibly have conduced to their discovery.

And so we may by all means hope that there are still many things of excellent use stored up in the lap of Nature having in them nothing kindred or parallel to what is already discovered, but lying quite out of the path of the imagination, which have not hitherto been discovered ; and they, doubtless, in the course and revolution of many ages, will also some day come forth of themselves, as their predecessors have done ; but by the method of which we are now treating they may be speedily, suddenly, and simultaneously presented and anticipated.

cx. But we have before us yet other discoveries of a kind which gives us reason to believe that mankind are liable to pass by and hurry over noble inventions which lie under their very feet. For however much the discovery of Gunpowder, or Silk, or the Compass, or Sugar, or Paper, or the like, may seem to depend on certain properties of things and of Nature, still certainly the Art of Printing has nothing in it which is not open and generally obvious. And nevertheless, because men did not remark that though it is more difficult to arrange type than to write letters with the hand, there was this difference in favour of type, that when once set up it suffices for innumerable impressions, while manuscript supplies only one copy ; or perhaps, again, because they did not observe that ink may be so thickened as to colour without running—as must especially be the case where the letters are placed face upwards, and the impression is taken from above—this most beautiful invention (which does so much for the propagation of Learning) was wanting to them for so many ages.

But the human mind is frequently so unlucky and ill-regulated in the course of invention, as first to distrust, and soon afterwards to despise itself ; and it appears at first sight incredible to it that any such discovery should be made, and when it has been made, it seems again incredible that it should have escaped notice so long. And this same fact gives rise to a just hope that there still remains a great mass of

inventions, which may be derived not only from modes of operating now unknown to us, but from the transferring, composition, and application of those already known, by means of what we have called *literate Experience*.

cx. Nor must we omit this motive for hope : let men consider, if they will, the infinite expenditure of abilities, of time and talents, which they bestow on matters and studies of very inferior utility and advantage ; a very small part of which, if turned to sound and substantial pursuits, would suffice to overcome all difficulties. And it has seemed good to us to add this, because we plainly confess that a collection of *Natural and Experimental History* such as we are planning in our mind, and such as it ought to be, is a great and, as it were, royal work, and one of much labour and expense.

cxii. In the mean time let no one be alarmed at the multitude of particulars, which ought rather to inspire hope. For the particular *Phenomena of the Arts and Nature* are but a handful, compared with the figments of the wit, after they have been separated and abstracted from the evidence of things. And the end of this road is open, and almost at hand ; of the other there is no end, but infinite involvement. For men have hitherto dwelt but little on *Experience*, and touched upon it but lightly, while they have wasted infinite time in meditations and inventions of the imagination. Now if we had any one at hand to answer questions as to the actual facts of *Nature*, the discovery of *Causes* and of all the *Sciences* would be the work of but a few years.

cxiii. We think, too, that some hope may be drawn from our own example ; nor do we say this out of boasting, but because it is advantageous to mention it. If any are fainthearted, let them look at me, who am, of all the men of my time, most occupied with affairs of state ; by no means of strong health (a circumstance which causes a great loss of time), and in this business absolutely a pioneer, a follower in no man's footsteps, who have never conferred with any mortal on these matters, and yet have entered with constancy on the true way, and submitting my intellect to actual facts, have, as I think, advanced these matters somewhat ; and then let them consider what may be expected from men rich in leisure, from combination of labour, and from the succession of ages, after these suggestions of mine ; especially as the way to be pursued is one which is accessible not to individuals only (as is the case with that rational method), but one in which the labours and endeavours of men (especially as regards the gathering of *Experience*) may with best effect be distributed and afterwards compared. For men will begin to know their own strength, when one man shall undertake one thing and another another, instead of a great number devoting themselves to the same thing.

cxiv. Lastly, even if the breath of hope had blown upon us far more weakly and doubtfully from this new Continent, yet we have determined, at all events, that we must make trial of it to the uttermost, unless we do not wish to be utter cowards. For it is not a case where there is equal risk in not trying and not succeeding ; since in the former instance we risk a huge advantage ; in the latter a little human

labour is thrown away. But from what has been said, and also from what has not been said, it seems to us that there is abundant ground of hope, not only to justify a stout-hearted man in trying, but even a prudent and sober man in believing.

cxv. And now we have spoken of the removal of despair, which has been one of the most potent causes of the delay and hinderance of the progress of the Sciences : and at the same time we have brought to a close what we had to say on the signs and causes of the errors, inactivity, and ignorance which have prevailed, especially as the more subtle causes, which do not come under popular criticism and observation, should be referred to what has been said concerning the Idols of the human mind.

And here, at the same time, ought to close the destructive part of our *Instauration*, which is completed in three confutations : the confutation, namely, of Human Reason, as natural and left to itself ; the confutation of Demonstrations ; and the confutation of Theories, or of received Philosophies and Systems of teaching. These confutations have been of the only kind available, namely, by means of signs, and the evidences of causes ; since no other kind of confutation could have been employed by us, dissenting as we do from others both on first principles and demonstrations.

Wherefore it is time that we should come to the Art and Rule itself for the Interpretation of Nature, and yet something remains to be previously remarked. For since it is our object, in this first book of Aphorisms, to prepare the minds of men to understand, as well as to receive, what follows : now that the field of the mind has been purified, cleaned, and levelled, it follows that we should place it in a good position, and give it, as it were, a favourable aspect for viewing what we shall set forth. For it seems greatly to increase prejudice in a new undertaking, not only that the mind should be strongly preoccupied by an old opinion, but also by a false anticipation and preconception of the matter in hand. And so we shall endeavour to bring about sound and true opinions on the subjects which we introduce, although they are to last for a time only, and serve, as it were, as interest, until the matter itself be thoroughly investigated.

cxvi. First, then, it seems right to request men not to think that we wish to found any sect in Philosophy, after the manner of the ancient Greeks, or of certain moderns, as Telesius, Patricius, and Severinus ; for neither is this our intention, nor do we think that it is of much importance to the fortunes of men what abstract opinions are held concerning Nature and the Principles of things ; for it is not to be doubted that many old theories of this kind might be revived, and new ones introduced ; just as very many schemes of the heavens have been supplied, which, while they agree well enough with appearances, yet differ among themselves.

But we do not spend our labour in matters so speculative and useless withal. On the contrary, we have determined to try whether we cannot indeed lay more firmly the foundations and enlarge the limits of human power and glory. And although here and there, and on

certain special subjects, we are in possession of far truer, and, as we think, more certain, and even more profitable results, than are as yet attained (which we have brought together in the fifth part of our *Instauration*), yet we are propounding no universal or complete theory, for the time does not seem yet to have arrived for so doing. And further, we have no hope that our life may be prolonged so as to complete the sixth part of the *Instauration* (which is set apart for Philosophy, as discovered by the legitimate interpretation of Nature), but are satisfied now to employ ourselves soberly and usefully on intermediate subjects, in the meantime scattering the seeds of a purer truth for those that come after us, and performing our part towards the commencement, at least, of the great undertaking.

cxvii. And as we are not founders of a sect, still less do we make offer or promise of particular results. But yet some one may object to us that we, who so often make mention of results, and urge all things in that direction, ought also to show pledges of some ourselves. But our method and plan (as we have often stated clearly, and yet like to repeat) is not to draw Results from Results, or Experiments from Experiments (as do the Empirics), but Causes and Axioms from Results and Experiments, and from those Causes and Axioms again new Results and Experiments (as a legitimate interpreter of Nature).

And though in our Tables of discovery (which constitute the fourth part of the *Instauration*), and even in the examples of particulars which we have introduced in the second part, and, above all, in our observations on History (which has been discussed in the third part of our work), any one possessing even a moderate amount of clear-sightedness and skill will everywhere remark indications and outlines of very many noble results; yet we candidly confess that the Natural History which we have as yet, either out of books or from individual inquiry, is not sufficiently copious and well verified to satisfy or assist legitimate interpretation.

And so, if there be any one more fitted and better prepared for mechanics, and sagacious in hunting out results, owing to his being exclusively conversant with Experiments, we leave and relinquish to him the labour of choosing out and applying to the production of results many matters of our History and Tables as he finds them on the road, to serve as interest for a time, until the principal can be had. But we, in aiming at greater things, condemn all hasty and premature delay over matters like these, which we are often wont to compare to the golden balls of Atalanta. For we do not grasp at golden apples like children, but stake all our hopes on the victory of Art over Nature in the race; nor are we so impatient as to wish to reap a crop of moss or green corn, but wait for the harvest in its season.

cxviii. It will doubtless occur to some, after reading our History and Tables of Invention, that there is in the Experiments themselves some uncertainty or error; and it will therefore, perhaps, be thought that our discoveries rest on false and doubtful principles for their foundation. But this is nothing; for it is necessary that such should be the case in the beginning. It is just as if, in writing or printing, one or two letters should be wrongly separated or combined, which

does not usually hinder the reader much, since the errors are easily corrected from the sense itself. And so men should reflect that many Experiments may erroneously be believed and received in Natural History, which are soon afterwards easily expunged and rejected by the discovery of Causes and Axioms. But yet it is true, that if the mistakes made in Natural History and in Experiments be important, frequent, and continuous, no felicity of wit or Art can avail to correct or amend them. And so, if in our Natural History, proved and collected as it has been with so great diligence, strictness, and I may almost say religious care, there should at times lurk in the particulars something false or erroneous, what must be said of the ordinary Natural History, which, compared with ours, is so careless and slipshod? or of the Philosophy and Sciences built on such sands, or rather quicksands? Let no one, then, be disturbed by the objections which we have mentioned.

cxix. There will be found too, in our History and Experiments, very many things, first of all, trifling and commonly known; then, mean and contracted: and lastly, too refined and merely speculative, and apparently useless; a state of things which may avert and alienate the attention of men.

But with regard to those things which appear common, let men consider that they have hitherto really been exclusively accustomed to refer and accommodate the causes of things which are rare to those which are of more frequent occurrence; while they never inquire after the causes of those frequent occurrences, but receive them as granted and admitted.

And so they do not seek for the causes of weight, rotation of the heavenly bodies, heat, cold, light, hardness, softness, rarity, density, liquidity, solidity, animation and its opposite, likeness and difference, or even of organization, but, receiving them as self-evident and manifest, dispute and adjudicate on other matters which are not of so frequent and familiar occurrence.

But we, who are well aware that no judgment can be formed about what is rare or remarkable, much less anything new be brought to light, without proper examination and discovery of the causes of common things, and the causes of those causes, are of necessity compelled to receive the most common things into our History. Besides, we find that nothing has done more harm to Philosophy than the circumstance that things which are common and of frequent occurrence do not arrest and detain men's contemplation, but are received in passing, usually without any inquiry after their causes; so that information about unknown things is not more often wanted than attention to those that are known.

cxx. And with regard to the meanness, or even the filthiness of things, for which (as Pliny says) an apology is required, such subjects must be admitted into Natural History equally with those that are most beautiful and precious. Nor is Natural History at all polluted thereby; for the sun enters palaces and sewers alike, and yet is not polluted. And we are not raising or dedicating any capitol or pyramid

to man's pride, but are laying the foundation in the human intellect of a holy temple, after the model of the universe. And so we follow our model. For whatever is worthy of existence is worthy of knowledge, which is the image of existence. Now, the mean has existence equally with the beautiful. Nay, as out of some putrid substances, such as musk or civet, excellent odours are sometimes generated, so also does valuable light and information sometimes emanate from mean and sordid instances. But too much of this; since such fastidiousness is clearly childish and effeminate.

cxxi. But the next objection must be looked into more carefully: we mean, that there are very many things in our History which will appear to the common apprehension, and indeed to any apprehension accustomed to the present state of things, curiously and needlessly refined. Therefore it is that we have already especially spoken of this objection, and must do so again. And this is our reply: that now at first, and for a certain time, we are seeking for light-bearing, and not fruit-bearing Experiments; following (as we have often said) the example of the Divine creation, which on the first day produced light only, and allotted one entire day to it alone, and did not mix up with it any material work on that day.

And so, to suppose that things of this kind are of no use is the same as to think Light of no use, because it is neither solid nor material. And in truth it must be owned that the knowledge of simple natures, when well examined and defined, is like Light, in that it affords an approach to all the mysteries of effects, and by a kind of influence includes and draws after it whole bands and troops of results, and opens out the sources of most noble Axioms, though in itself it be of no great use. So also the elementary letters have no significance when taken separately and by themselves. Nevertheless, they serve as the first material for the composition and preparation of all discourse. Even the seeds of thing, strong in their possible effect, are of no use except in their growth. And the scattered rays of light itself, unless they converge, impart none of their benefit.

But if these speculative subtleties give offence, what will be said of the Schoolmen, who indulged in subtleties to such excess? And in subtleties, too, which were expended on words, or at least (which comes to the same thing) on vulgar notions, and not on things or on Nature: which were useless not only in their origin, but also in their consequences; and not like those spoken of by us, which promise infinite advantages in their consequences, though they possess none at present. But let men know this for certain, that all subtlety of disputation and mental discussion is too late and preposterous if not applied till after the discovery of Axioms, and that the true and proper, or, at any rate, the principal opportunity for subtlety is during the weighing of Experience, and the subsequent construction of Axioms; for that other subtlety only catches and grasps at Nature without ever seizing or holding her. And certainly what is usually said of Opportunity or Fortune is most true of Nature, viz., "That she has a lock of hair in front, but is bald behind."

Lastly, when in Natural History contempt is expressed for any subject as being either common or mean, or too refined and useless in its original condition, we may take as our oracle that speech of the poor woman to the proud prince, who would have cast aside her petition as something unworthy and beneath his majesty,—“Cease then to be a king!” for it is most certain that the empire over Nature can neither be gained nor wielded by any one who refuses to attend to things of this kind, as being too insignificant and trifling.

cxii. Again, the objection occurs, that it is a strange and harsh proceeding for us to set aside all Sciences and all Authorities at once, as it were by one blow and assault, and that without calling in assistance and support from any of the ancients, but, so to speak, by our own unaided strength.

But we know that, if we had chosen to act with less sincerity, it would not have been difficult to have supported our propositions by referring them either to the old times prior to the days of the Greeks (when Natural Science was perhaps more flourishing, though less noisy, from not having yet fallen in with the pipes and trumpets of the Greeks); or even (in parts at least) to some of the Greeks themselves; and thence to have sought authority and honour, after the custom of upstarts, who by the aid of genealogies contrive and fabricate for themselves a noble descent from some ancient line. But we, relying on the evidence of things, reject every condition of falsehood and imposture, and do not think it matters any more to our subject whether discoveries, now to be made, were formerly known to the ancients, and have their settings and risings according to the vicissitude of things and course of time, than it matters to mankind to know whether the New Hemisphere be that island of Atlantis which was known to the Old World, or be now discovered for the first time. For the discovery of things must be sought from the light of Nature, and not brought back from the darkness of antiquity.

But with regard to the censure being universal, it is quite certain, to any one who rightly considers the matter, that it is more probable and more modest than a partial one would have been. For if the errors had not been rooted in first notions, there must have been some true discoveries to correct those that were erroneous. But since the errors were fundamental, and of such a kind as to lead rather to the neglect and oversight of things than to the forming a bad or false judgment about them, it is not to be wondered that men have not obtained what they never aimed at; that they have not reached a goal which they have never placed or settled; that they have not accomplished a journey which they have never entered upon or pursued.

And as regards the presumption of the thing; certainly, if any one were to undertake, by steadiness of hand and power of eye, to draw a straighter line, or a more perfect circle, than any one else, he would be inducing a comparison of abilities; but if he were to assert that by applying a rule or compasses he could draw a straighter line, or a more perfect circle, than any one else could by the help

of eye and hand alone, he certainly would be no great boaster. Now, this remark applies not only to this our first and initial attempt, but also to those who shall hereafter follow up this subject. For our method of discovering Sciences goes far to equalize men's abilities, and leaves them individually no great room for excelling, since it performs everything by most certain rules and demonstrations. And so our share in this matter (as we have often said) is the result of good fortune rather than ability, and the offspring of time rather than of wit. For, certainly, chance has as much to do with human thought as with human works and deeds.

cxiii. And so we must repeat of ourselves (especially as it hits off the matter so readily) that jest, that "water-drinkers and wine-drinkers cannot possibly think alike." For all other men, both ancients and moderns, have in the Sciences drunk a crude liquor like water, either springing spontaneously out of their Intellect or drawn up by Logic, as by wheels from a well. But we drink and pledge our neighbours in a liquor made from countless grapes, ripe and in season; collected and gathered by clusters; crushed in the wine-press, and, lastly, fined and clarified in the vat. And so no wonder if we have not much in common with others.

cxiv. And doubtless, it will be further objected that the goal and mark of the Sciences, which we have set before ourselves, is not the true or the best (the very fault which we blame in others). For it will be said that the contemplation of truth is a more worthy and a loftier matter than all utility and magnitude of results; and that this long and anxious dwelling upon Experience and Matter, and the fluctuation of particular things, chains the mind to the ground, or rather casts it down into a very hell of confusion and disturbance; removing and withdrawing it to a distance from the serenity and tranquillity of abstract wisdom (which is a far more godlike state). Now, we readily assent to this reasoning, and are chiefly and especially busied with this very point which is therein hinted at as desirable. For we are building in the human Intellect a copy of the universe such as it is discovered to be, and not as a man's own reason would have ordered it. Now, this cannot be accomplished without a very diligent dissection and anatomy of the universe; but we declare that those foolish models and apish imitations of the world which the fancies of men have woven in their Philosophies must be utterly given to the winds. Therefore let all men know (as we have said above) how much difference there is between the *idola* of the human Mind and the Ideas of the Divine. For the former are nothing but arbitrary abstractions; the latter are the true stamps of the Creator upon his creatures, impressed and defined in matter by true and exquisite lines. And so truth and utility in this case are the very same things; and results themselves are to be more esteemed, as being pledges of truth, than as supplying conveniences for life.

cxv. It may perhaps also be objected, that we are doing what is already done, and that the ancients themselves took the same course which we are taking. And so it will be thought probable that we

also, after all this stir and trouble, shall arrive at some one of those systems of Philosophies which prevailed among the ancients. For they too, in the outset of their reflections, prepared a great store and abundance of examples and particulars, and digested them into common-place books, under heads and titles, and from these composed their Philosophies and Arts; and afterwards, when the subject was thoroughly known, pronounced judgment, occasionally adding examples for confirmation and illustration; but thought it superfluous and troublesome to publish their notes of particulars, their minutes, and common-place books, and therefore followed the example of builders, who remove their scaffolding and ladders out of sight as soon as the building is finished. Nor may we refuse to believe that they did so. But unless what has been said above be entirely forgotten, it will be easy to answer this objection, or rather scruple. For that the ancients had a form of inquiring and discovering we ourselves allow, and the fact appears on the face of their writings. But their form was simply this. From certain examples and particulars (with the addition of common notions, and perhaps of some portion of the received opinions which were most popular) they flew to the most general conclusions or principles of Science; and, treating the truth of these as fixed and immovable, they deduced and proved inferior conclusions by means of intermediate propositions, and out of these they constructed their art. And then, if new particulars and examples were mooted and adduced which contradicted their conclusions, they either craftily reduced them to order by means of distinctions or explanations of their rules, or else got rid of them in the gross by means of exceptions; while to such particulars as were not contradictory they pertinaciously laboured to accommodate causes in conformity with their own principles. But this Natural History and Experience was far from what it ought to be; and that flying off to the highest generalities ruined everything.

cxxvi. Again, it will be objected, that, in prohibiting the passing a judgment and the laying down of fixed principles, until the highest generalities have been arrived at by the intermediate steps, we are defending a suspension of judgment and leading to Acatalepsy. But what we contemplate and propound is not Acatalepsy, but the reverse; for instead of derogating from the sense, we minister to it; and in place of slighting the Intellect, we regulate it. And it is better to know all that we need, and yet think that we do not know everything, than to think that we know everything, and yet know nothing that is needful.

cxxvii. Moreover, some will ask, by way of doubting rather than of objecting, whether we intend Natural Philosophy only, or other Sciences as well—Logic, Ethics, and Politics—to be carried out by this method of ours. Now, we certainly understand that what we have said holds universally, and just as the common Logic, which regulates matters by syllogism, belongs not only to the natural, but to all Sciences; so also our method, which proceeds by Induction, embraces all subjects. For we form a History and Tables of discovery for anger, fear, shame,

and the like ; and also for examples of civil affairs and for the mental operations of memory, composition, division, judgment, and the rest, no less than for heat and cold, light, vegetation, or the like. But since our method of interpreting, when once the History is prepared and arranged, employs itself not only with the emotions and disquisitions of the Mind (as does the popular Logic), but also looks into the nature of things, we so regulate the Mind that it may be able to apply itself to the nature of things by methods fitted for all cases. And therefore we give many diverse directions in the doctrine of Interpretation, that they may supply in some degree a method of discovery proportioned to the quality and condition of the subject under inquiry.

cxxviii. But on this one point there must be not even a doubt ; viz. whether we desire to overthrow and destroy the Philosophy, the Arts, and Sciences now in use ; for, on the contrary, we gladly see them used, cultivated, and honoured. Nor do we by any means wish to hinder those which are in vogue from supplying food for disputations, adorning discourses, and being applied with success to professional practice and the duties of common life ; from being in short, like coin, received among men by mutual consent. Nay, we plainly declare that what we introduce will not be well adapted to these purposes, inasmuch as it cannot in any way be brought down to the common grasp, except by means of effects and results. But the writings already published by us, especially our work on the Advancement of Learning, prove how sincere we are in our profession of affection and good-will towards the received Sciences. And so we shall not attempt to prove it any more by words. In the meantime we give constant and distinct warning that, by the methods now in use, no great progress can be made in the doctrines and contemplation of the Sciences, nor can they be brought to yield any extended results.

cxxix. It remains for us to say a few words as to the excellence of our end. If they had been spoken earlier, they might have seemed the reflection of our wishes ; but now that hopes have been raised and unfair prejudices removed, they will perhaps have more weight. And if we had accomplished and discharged the whole ourselves, without calling others to part and share in our labours, we should also have abstained from language of this kind, lest it should be taken as a declaration of our own merits. But as the industry of others has to be sharpened, and their minds roused and kindled, it is fitting that we should recall certain facts to men's minds.

And so, first, the introduction of noble discoveries seems to hold by far the highest place among human actions ; and such was the judgment of ancient times. For to inventors they paid divine honours, while to those who did good service in civil affairs (such as founders of cities and empires, law-givers, men who freed their country from lasting evils, overthrowers of tyrannies, and the like) they only decreed the rank of heroes. And certainly, if we rightly compare these things, we shall find that this judgment of antiquity is just. For whereas the benefits arising from discoveries may extend to the whole human race, those of a civil nature affect only certain

settlements of men ; the latter, too, do not last beyond a few ages, the former, as it were, for ever. Besides, a civil reformation is seldom unaccompanied by violence and disturbance, but discoveries diffuse blessings and confer benefits without injury or sorrow to any one.

Again, discoveries are, as it were, new creations and imitations of God's works : and the poet has well sung,—

“Primum frugiferos fœtus mortalibus ægris
Dididerant quondam præstanti nomine Athenæ:
Et recreaverunt vitam, legesque rogarunt.”

And it seems worthy of notice in Solomon, that whilst he was flourishing in power, wealth, the magnificence of his works, his attendants, his household, and his fleet—in the lustre of his name and the highest admiration of men—he chose none of those things as his glory, but declared that “it is the glory of God to conceal a thing, but the honour of kings to search out a matter.”

Again, let any one consider, if he pleases, how great a difference there is between the life of men in the most civilized part of Europe and in the wildest and most barbarous region of new India : he will think the difference so great as to justify the saying, “Man is a God to man,” not only in regard of age and advantages, but also from a comparison of condition. And this superiority is the result, not of soil, nor of climate, nor of bodies, but of Arts.

Again, it is well to mark the force, virtue, and consequences of discoveries ; and these occur nowhere more manifestly than in those which were unknown to the ancients, and whose origin, though recent, is obscure and inglorious ; the Arts, namely, of Printing, of Gunpowder, and the Mariner's Compass. For these three have changed the face and condition of things all over the world ; the first in letters, the second in war, the third in navigation. And hence numberless changes have followed ; so that no government, no sect, no star, seems to have exercised greater power and influence over human affairs than these mechanical discoveries.

Besides, it will not be amiss to distinguish the three kinds, and, as it were, degrees of human ambition. The first is that of those who wish to increase their own influence in their country ; and this is a common and degenerate kind. The second, that of those who strive to enlarge the influence and power of their country among the human race ; this kind is more dignified, but not less covetous. But when a man endeavours to restore and increase the power and influence of the human race itself over the universe, his is, without doubt, an ambition (if such it may be called) at once sounder and grander than the rest. Now, the empire of man over things is founded on the Arts and Sciences alone, for Nature is only governed by obeying her.

Besides, if the advantages of any one particular invention have so affected men as to make them think that he who can oblige the whole human race by any benefit is more than man, how much nobler will it seem to make such a discovery as shall expedite the way to the discovery of all other things ? And yet (to speak the whole truth),

just as we are deeply indebted to light because it enables us to enter upon our way, to exercise Arts, to read, to distinguish one another, and nevertheless the sight of light is itself more excellent and beautiful than the manifold uses of it ; so, assuredly, the very contemplation of things as they are, without superstition or imposture, without error or confusion, is in itself more worthy than all the produce of discoveries.

Lastly, let none be moved by the objection that the Arts and Sciences will be degraded to the ends of malice, luxury, and the like. For the same may be said of every earthly good—of wit, bravery, strength, beauty, riches, light itself, and the rest. Let the human race only recover the rights over Nature which by God's endowment belong to it ; and let power be given it, right Reason and sound Religion will direct its application,

cxix. But now it is time for us to propound the Art itself of Interpreting Nature, which, though we think that we have given for it precepts most useful and true, we yet do not assert to be absolutely necessary (as if nothing could be accomplished without it), nor even to be perfect. For we are of opinion that if men had in their hands a just History of Nature and Experience, and exercised themselves diligently therein, and could impose two conditions upon themselves ; first, to lay aside received opinions and notions ; and secondly, to restrain their minds for a time from the highest generalities, and those next to them ; they might, by the proper and genuine power of their minds, without any other art, fall into our form of Interpretation. For Interpretation is the true and natural operation of the mind after the removal of the obstacles. Nevertheless, we are certain that by our precepts everything will be made more ready and much more stable.

Nor do we affirm that nothing can be added to these things ; on the contrary, we who regard the mind, not only in its own faculties, but as it is connected with things, are bound to hold that the Art of Discovery may keep pace with discoveries themselves.

BOOK II.

APHORISMS ON THE INTERPRETATIONS OF NATURE OR THE KINGDOM OF MAN.

I. UPON a given body to generate and superinduce a new Nature or Natures, is the work and aim of human power. And to discover the Form of a Nature, or its true difference, or the Nature originating Nature, or the source of emanation (for these are the available terms which approach nearest to a description of the thing), is the work and aim of human Knowledge. And subordinate to these primary works are two others which are secondary, and of an inferior stamp : to the former, the transformation of concrete bodies from one into another, within possible limits ; to the latter, the discovery, in all

generation and motion, of the *Latent Process*, carried on from the manifest efficient and manifest material to the inward Form ; and the discovery, in a similar way, of the *Latent Structure* of bodies at rest and not in motion.

ii. The unhappy condition of human Knowledge at the present time is clear, even from what is commonly asserted concerning it. It is rightly said, that "truly to know is to know by Causes." Also, the constitution of four Causes is not without merit: viz. Material, Formal, Efficient, and Final. But of these the Final Cause is so far from advancing knowledge, that it even corrupts it, except when brought to bear on the actions of men. The discovery of the Formal is despaired of; but the Efficient and the Material Causes (as they are sought for and received, that is to say, as remote, and without the *Latent Process* to Form), are trifling and superficial, and of very little use to true and active Science. Nor do we forget that we have already noticed and corrected, as an error of the human mind, the assigning to Forms the first qualities of Essence. For though in Nature nothing really exists except individual bodies, exhibiting pure individual acts according to law, yet, in the matter of learning, that same law, with its investigation, discovery, and explication, is the foundation both of knowledge and practice. This Law and its *Paragraphs* are what we understand by the name of Forms; a term which we use because it has obtained weight, and is of familiar occurrence.

iii. That knowledge of any Nature (such as whiteness, or heat), which is drawn from certain subjects only, is imperfect; and that power is equally imperfect which can induce an effect on certain materials only (among those which are susceptible of it). Now, the knowledge of the Efficient and Material Causes alone (which are fluctuating, and mere vehicles and causes conveying Form in certain cases) will enable us to arrive at new discoveries in matter which is somewhat similar and ready prepared, but not to stir the more deeply rooted boundaries of things. But he who knows Forms grasps the unity of Nature in the most dissimilar materials, and so can detect and bring forward things which have never yet been done, and such as neither the changes of Nature, nor the industry of experimentalists, nor chance itself, would ever have brought into action, and which would never have occurred to the thought of man. Wherefore, from the discovery of Forms follow both contemplation and freedom in operation.

iv. Although the roads to human power and knowledge are closely united and nearly the same; yet, on account of the pernicious and inveterate habit of dwelling upon abstractions, it is far safer to begin and raise the Sciences from these foundations which have reference to practice, and to let practice mark out and define the province of contemplation. And if we wish to generate and super-induce any Nature upon a given body, we must look for the most desirable precept, direction, or guidance for that purpose, and express it in simple and unabstruse language.

For example, if any one wishes to superinduce upon silver the yellow colour of gold, or an increase in weight (the laws of matter being observed), or transparency upon any opaque stone, or tenacity upon glass, or vegetation upon a new vegetable substance, we must see, I say, what kind of precept or direction he would most wish for. And first, he will doubtless desire something to be shown him of a kind which shall not deceive him in operation, or fail him in the trial. Secondly, he will desire that something should be prescribed which shall not restrain and tie him down to certain means and particular modes of operation. For he will perhaps be at a loss, from not having either power or convenience for obtaining and procuring such means. But if there be also other means and other methods (besides those prescribed) of producing such a Nature, some of them may perhaps be within the reach of the operator; from which, nevertheless, he will be excluded by the stringency of the rule, and will reap no advantage from them. Thirdly, he will desire something to be shown him which may not be so difficult as that operation into which he is inquiring, but which may approach nearer to practice.

And so the precept for the true and perfect rule of practice will be, *that it be sure, free, and disposing, or in the road to action.* And this is the same thing as the discovery of a true Form. For the Form of any Nature is such, that when it is laid down the given Nature infallibly follows. And so it is always present when that Nature is present, and universally affirms its presence and is inherent in the whole of it. The same Form is such, that, when it is removed, the given Nature infallibly disappears. And so it is invariably absent when that Nature is absent, and invariably affirms its absence, and exists in it alone. Lastly, the true Form is such that it deduces the given Nature from some source of Essence which is inherent in things, and is better known to Nature, as they say, than Form itself. And so this is our judgment and precept respecting a true and perfect Axiom for knowledge, *that another Nature be discovered which shall be convertible with the given Nature, and yet be a limitation of a more general Nature, like a true genus.* Now, these two directions, the practical and the contemplative, are the same thing; and that which is most useful in operation is most true in knowledge.

v. The Rule or Axiom for the transformation of bodies is of two kinds. The first regards a body as a collection or combination of simple Natures. Thus, in gold the following properties meet: it is yellow, heavy, and of a certain weight; it is malleable or ductile to a certain degree of extension; it is not volatile, and loses none of its substance by fire; it becomes fluid with certain degrees of fluidity; it is separated and dissolved by certain means; and so of the other Natures which meet in gold. And thus an Axiom of this kind deduces the subject from the Forms of simple Natures. For he who is acquainted with the forms and modes of superinducing yellowness, weight, ductility, fixity, fluidity, solution, and the rest, with their gradations and methods, will see and take care that these properties

be united in some body, whence its transformation into gold may follow. And this kind of operation belongs to primary Action. For the method of generating one simple Nature is the same as that of generating many, except that man is more tied and restricted in operation when many are required, on account of the difficulty of uniting so many Natures; for they do not combine readily except in the beaten and ordinary paths of Nature. Still it must be observed, that this mode of operating (which regards simple Natures, although in a concrete body) sets out from what is constant, eternal, and universal in Nature, and offers such broad paths to human power, as (in the present state of things) human thought can scarcely comprehend or imagine.

But the second kind of Axiom (which depends upon the discovery of the *Latent Process*) does not proceed by simple Natures, but by concrete bodies, as they are found in Nature, in its ordinary course. For example, where inquiry is being made, from what beginnings, and in what manner, and by what process, gold, or any other metal or stone is generated from the first menstrua, or rudiments, up to the perfect mineral; or, in like manner, by what process herbs are generated from the first concretions of juices in the earth, or from seeds, up to the full-formed plant, with the whole successive motion and different and continued efforts of Nature; also of the generation of animals as unfolded in order, from coition to birth; and so of other bodies.

Nor is this inquiry confined to the generation of bodies; it extends to other motions and operations of Nature. Take, for example, the case of an inquiry into the whole course and continued action of nutrition, from the first reception of the nourishment to its perfect assimilation; or into the voluntary motion of animals, from the first impression of the imagination and the continuous efforts of the spirit, to the bending and movements of the limbs; or into the free motion of the tongue, lips, and other organs, up to the utterance of the articulate sounds. For these also refer to concrete or collected Natures in their growth, and regard, as it were, particular and special habits of Nature, and not the fundamental and common laws which constitute Forms. But still we must freely confess that this method appears to be more expeditious, to be nearer at hand, and to yield more promise than the primary one.

Similarly, the operative part, which answers to the contemplative part, extends and advances its operation from those things which are ordinarily found in Nature to others which are proximate, or not very far removed from proximate. But the deeper and radical operations upon Nature depend entirely upon primary Axioms. Moreover, in cases where man has not the means of operating, but only of knowing, as in Astronomy (for he is not allowed to operate on the heavenly bodies, or to change or transform them), the investigation of actual fact, of the truth of a circumstance, no less than the knowledge of causes and agreements, is referred to the primary and universal Axioms concerning simple Natures (as the Nature of spontaneous

rotations, of attraction, or magnetic influence, and many other things which are of more common occurrence than astronomical questions). For no one may hope to determine the question whether it be the earth or heaven that really revolves in daily motion, unless he shall first have comprehended the nature of spontaneous motion.

vi. But the *Latent Process* of which we speak is by no means the kind of thing which could easily occur to the minds of men (occupied as they are now). For by it we do not understand certain measures, or signs, or steps of procession, in bodies which can be perceived; but a regularly continued process, which, for the most part, escapes the sense. For example, in all generation and transformation of bodies we must inquire what is lost and flies off, what remains, what is added, what dilatation or contraction takes place, what union, what separation, what is continued, what is broken off, what impels, what hinders, what is powerful and what weak, and many other particulars.

And here, again, not only are these points to be considered, in the generation or transformation of bodies, but also in all other alterations and motions a similar inquiry must be made as to what goes before and what succeeds, what is quicker and what more remiss, what causes motion and what governs it, and questions of the like sort. But all these points are unknown and untouched in the present state of the Sciences, constructed as they are after a most rude and clumsy fashion. For since all natural action is carried on by steps infinitely small, or at least too small to strike the sense, no one may hope to govern or change Nature until he has duly comprehended and noted them.

vii. In like manner, the investigation and discovery of *Latent Structure* in bodies is a new thing, no less than the discovery of *Latent Process* and Form. For we are as yet merely walking in the entrance-halls of Nature, and are not ready for an approach to her inner shrines. Now, no one can endue a given body with a new nature, or successfully and suitably transmute it into a new body, unless he has a good knowledge of the body to be changed or transformed. For he will run into methods which are vain, or at least difficult and perverse, and unfitted for the nature of the body on which he is operating. And so for this also a way must be opened and constructed.

Now, upon the anatomy of organic bodies (as of men and animals), labour has been rightly and advantageously spent; and it seems to be a subtle matter, and a good scrutiny of Nature. But this kind of anatomy is visible and subject to sense, and has place only in organic bodies. And it is something obvious and ready at hand, in comparison with the true anatomy of *Latent Structure* in bodies which are held to be similar, especially in things of a specific character, and their parts, as iron or stone; and in the similar parts of plants or animals, as the root, the leaves, the flower, flesh, blood, bone, &c. But even in this kind of anatomy human industry has not been entirely idle; for the very thing intended by the separation of similar bodies by distillation, and other methods of solution, is that the dissimilarity of

the compound may be made to appear through the gathering together of the homogeneous parts. And this is of use, and tends to advance our inquiry, although it is too often deceptive ; since very many Natures are imputed and attributed to separation, as if they had previously subsisted in the compound, which have really been added and superinduced by fire and heat, and other means of separation. But even this is but a small part of the work of discovering the true Structure in a compound ; for the Structure is something far more subtle and exact, and is rather thrown into confusion by the working of fire than drawn out and brought to light by it.

And so the separation and solution of bodies must be brought about, not by fire certainly, but by method and a true *Induction*, with Experiments to aid ; and by comparison with other bodies, and a reduction to simple Natures and their Forms, which meet and are mingled in the compound ; and we must pass straight from Vulcan to Minerva, if we would bring to light the true textures and Structures of bodies ; on which all occult, and (as they are called) specific properties and virtues in things depend ; and from which every rule of effectual alteration and transformation is educed.

For example, inquiry is to be made what spirit there is in every body, what tangible Essence, and whether that spirit be copious and turgid or scanty and poor ; whether it be refined or gross, akin to air or fire, brisk or sluggish, weak or strong, progressive or retrograde, abrupt or continuous, agreeing or disagreeing with external and surrounding objects, &c. And a similar course must be pursued with tangible Essence (which admits of as many differences as Spirit), its coats, fibre, and various texture. Again, the disposition of spirit through the corporeal mass, and its pores, passages, veins, and cells, and the rudiments or first attempts of the organic body, fall under the same investigation. But on these inquiries also, and so on the whole discovery of *Latent Structure*, a true and clear light is thrown by primary Axioms, which completely disperses all darkness and subtlety.

viii. Nor will the question be thus referred to the doctrine of Atoms, which presupposes a vacuum and the unchangeableness of matter (both wrong suppositions), but to true particles, as they are found to exist. Nor, again, is there any reason to be alarmed at this subtlety, as if it were inexplicable ; but, on the contrary, the nearer the inquiry tends to simple Natures, the more plain and perspicuous will the thing appear, when the question is transferred from the manifold to the simple, from the incommensurable to the commensurable, from the surd to the rational quantity, from the indefinite and vague to the definite and fixed ; as in the case of elementary letters and harmonic tones. And inquiry into Nature is most successful when Physics are defined by Mathematics. And again, let no one fear large numbers or fractions ; for in dealing with numbers it is as easy to set down or to conceive a thousand as one, or the thousandth part of an integer as the integer itself.

ix. Out of the two kinds of Axioms already described arises a true:

division of Philosophy and the Sciences, adapting the received terminology (which comes nearest to the description of the thing) to our views. For instance, let the inquiry into Forms, which are (in reason at least, and by their peculiar law) eternal and unchangeable, constitute *Metaphysics*; and let the inquiry into the Efficient and the Material Causes and the *Latent Process* and *Latent Structure* (all of which regard the common and ordinary course of Nature, not her fundamental and eternal laws) constitute *Physics*; and to these let there be subordinate two practical subdivisions; to *Physics*, *Mechanics*; to *Metaphysics* (the word being used in its purest sense), *Magic*, on account of its extended field and greater command over Nature.

x. And so, having fixed the object of our teaching, we must go on to precepts, and that in an order as little irregular and disturbed as possible. And our directions for the Interpretation of Nature are twofold in kind; the first kind concerns the drawing out or eliciting Axioms from Experiments; the second, the deducing or deriving new Experiments from Axioms. Now, the former is divided into three heads or ministrations: viz. ministration to the sense; ministration to the memory; and ministration to the mind, or the reason.

For first, a natural and experimental History must be prepared, sufficient and good, this being the foundation of the business; and we must not imagine or think, but discover, what Nature may do or bear.

But natural and experimental History is so varied and scattered as to confuse and distract the Intellect, unless it be stayed and appear in proper order. And so *Tables* and *Co-ordinate Instances* must be formed, in such a manner and arrangement, that the Intellect may be able to act upon them.

But even when this is done, the Understanding, left to itself and acting spontaneously, is incompetent and ill-suited for the construction of Axioms, unless it be regulated and guarded. And so, in the third place, we must employ a legitimate and true *Induction*, which is the very key of Interpretation. And here we must begin at the end, and work backward to what remains.

xi. The inquiry after Forms proceeds thus: when a Nature has been given, we must first make a *joint presentation* to the Understanding of all known *Instances* which agree in the same Nature, although in matter most dissimilar. And a collection of this kind must be made in the fashion of a history, and without over-hasty speculation or too great refinement. For example, in an inquiry after the form of Heat, we have,

Instances agreeing in the Nature of Heat.

1. Rays of the Sun, especially in summer and at noon.
2. Rays of the Sun, reflected and condensed, as between mountains or from walls of houses, and especially in burning glasses.
3. Flaming Meteors.
4. Burning Thunderbolts.
5. Eructations of Flame from the cavities of mountains, &c.

6. All Flame.
7. Ignited Solids.
8. Natural Warm Baths.
9. Boiling or Heated Liquids.
10. Glowing Vapours and Smoke, and Air itself, which admits of a most intense and raging heat if confined, as in *reverberatories*.
11. Any Seasons which are fair through the constitution of the air, without taking into account the time of year.
12. Air confined under the earth in certain caverns, especially in winter.
13. All hairy Substances, as wool, skins of animals, and plumage, have some heat.
14. All Bodies, solid as well as liquid, dense as well as rare (such as air itself), brought near the fire for a time.
15. Sparks struck from flint and steel by strong percussion.
16. All Bodies strongly rubbed, as stone, wood, cloth, &c. ; so that poles of carriages and axles sometimes catch fire ; and the usual way in which the West Indians kindled fire was by rubbing.
17. Green and damp Herbs, shut up and packed together, as roses and peas in baskets ; so that hay, if it be stacked when damp, often takes fire.
18. Quick-lime slaked with water.
19. Iron when it is first dissolved by *aqua fortis* in glass, and that without putting it by the fire ; and tin and other things in like manner, but not so intensely.
20. Animals especially, and always internally ; although in insects the heat is not perceptible to the touch, on account of the smallness of their bodies.
21. Horse-dung, and the recent excrements of animals.
22. Strong Oil of Sulphur and Vitriol produce the result of heat in burning linen.
23. Oil of Marjoram, and the like, produce the result of heat in burning the bony parts of the teeth.
24. Strong and well-rectified Spirit of Wine exhibits the property of heat ; so that if white of eggs be thrown into it, it coagulates and becomes white, as it does when boiled : bread thrown into it becomes dried and crusted, as it does when toasted.
25. Aromatic Substances and warm Plants, as the *Dracunculus*, the old *Nasturtium*, &c., although they are not warm to the hand, either when applied whole or in powder, yet when slightly chewed appear warm, and after a fashion scorching, to the tongue and palate.
26. Strong Vinegar and all acids cause a pain in a member where there is no skin ; as the eye, or the tongue ; or in any part that is wounded and stripped of its skin, differing but little from that induced by heat.
27. Also sharp and intense Cold induces a certain sense of burning :—
Nam Boreæ penetrabile frigus adurit.
28. Other Instances.

This we are accustomed to call the *Table of Existence and Presence*.

xii. Secondly, a presentation to the Understanding must be made of *Instances* which are wanting in the given Nature ; because the Form (as we have said) ought no less to be absent where the given Nature is absent, than present where it is present. But to follow this out in all cases would be useless ; and so we must subjoin the negatives to the affirmatives, and only look into the absence of the Nature in these subjects which are most allied to those others in which the given Nature is inherent and apparent. This we are accustomed to call the *Table of Declination, or of Absence in Proximity*.

Instances in Proximity wanting the Nature of Heat.

First Instance, Negative or Subjunctive, to the First Affirmative Instance.

1. The rays of the moon, of the stars and comets, are not found to be hot to the touch ; nay, rather, the sharpest cold is usually observed at time of full moon. But the larger fixed stars, when the sun passes under or approaches them, are thought to increase and tensify its heat, as is the case when the sun stands in the sign of the Lion, and in the dog days.

To the Second.

2. The rays of the sun in the mid region of the air, as they call it, give no heat ; and the reason which is commonly given for this is not a bad one, viz., that that region is neither near enough the body of the sun, whence the rays emanate, nor to the earth, whence they are reflected, to be much affected by them. And this is clear from the fact, that on the tops of mountains (which are not very high) the snow is perpetual. But, on the other hand, it has been remarked by some that on the summit of the Peak of Teneriffe, and also on the Peruvian Andes, the very tops of the mountains are devoid of snow, which lies only in spots lower down the ascent. And, moreover, the air on these same summits is found to be far from cold, but only rare and keen ; so much so, that on the Andes it irritates and wounds the eyes by its excessive sharpness, and even irritates the orifice of the stomach, and induces vomiting. And it has been remarked by the ancients, that so great is the rarity of the air on the top of Olympus, that it was necessary for those who ascended to take with them sponges moistened with vinegar and water, and to apply them continually to the mouth and nostrils, the air being so rare as not to suffice for respiration. And so serene is that summit said to have been, and so free from rain, and snow, and wind, that when sacrifices were offered there, the letters traced in the ashes of the sacrifices on the altar of Jupiter remained undisturbed until the next year. And even at the present day the ascent of the Peak of Teneriffe is made by night, and not by day ; and shortly after sunrise travellers are warned and urged by their guides to descend as quickly as possible, on account of the

danger (as it appears) of their being suffocated by the rarity of the atmosphere.

To the Second.

3. The reflection of the rays of the sun in regions near the polar circles is found to be very slight, and barren of heat ; so that the Dutch who wintered in Nova Zembla, and were expecting their ship to be liberated and disentangled from the mass of ice (by which it was beset) about the beginning of July, were disappointed of their expectation, and compelled to take to their boat. Thus the direct rays of the sun seem to have but little power, even upon level ground, nor have they much even when reflected, unless they be multiplied and combined ; as is the case when the sun inclines much to the perpendicular, because then the incident rays make acuter angles, so that the lines of the rays are nearer together ; while, on the other hand, when the sun shines very obliquely, the angles are very obtuse, and consequently the lines of the rays more distant from one another. But in the meantime it must be remarked that there may be many operations of the sun's rays, and those even of the nature of heat, which are not proportioned to our sense of touch ; so that while in respect of us they do not produce warmth, still, in respect of some other bodies, they have the effect of heat.

To the Second.

4. Let this experiment be made. Take a lens fashioned in a contrary way to the usual burning lenses, and place it between the hand and the sun's rays, observing whether it diminishes the heat of the sun as the burning lens increases and intensifies it. For it is manifest, in the case of optical rays, that in proportion as the lens is made of unequal thickness, in respect of its centre and sides, will objects appear magnified or contracted. And so it must be seen whether the same is the case with heat.

To the Second.

5. Let experiment be diligently made whether, by means of burning lenses of the greatest power and the best make, the rays of the moon can be taken up and collected so as to produce even the smallest degree of warmth. But if that degree of warmth be too subtle and weak to be perceived and felt by the touch, recourse must then be had to those glasses which indicate the condition of the air with respect to heat and cold ; so that the rays of the moon may fall through a burning lens, and be thrown on the top of a glass of this kind ; and then let it be noted if the water be depressed by the warmth.

To the Second.

6. Let the burning glass be also tried on some warm body, which gives forth neither rays nor light ; as iron and stone heated, but not ignited, or hot water and the like ; and let it be noted whether the heat be increased or intensified, as in the case of the sun's rays.

To the Second.

7. Let the burning lens be also tried upon common flame.

To the Third.

8. Comets (if, indeed, we choose to reckon them among meteors) are not found to possess any constant or manifest effect in increasing the heat of the year, although droughts have been frequently observed to follow their appearance. Moreover, beams, and columns of light, and chasms, and the like, appear oftener in winter than in summer, and most of all during intense cold, but always accompanied by drought. Yet lightning, coruscations, and thunder rarely happen in winter, but at the time of great heats; while falling stars (as they are called) are commonly thought to consist of some bright and inflamed material of a viscous character, rather than to be of a strong or fiery nature. But of this let further inquiry be made.

To the Fourth.

9. There are some coruscations which emit light, but do not burn; but these are never followed by thunder.

To the Fifth.

10. Eructations and eruptions of flame are found no less in cold than hot regions, as in Iceland and Greenland; just as also the trees in cold regions are sometimes more inflammable, and contain more pitch and resin, than in hot regions, as is the case with the fir, the pine, and others. But sufficient inquiry has not been made as to the position and nature of the soil in which eruptions of this kind usually take place, to enable us to subjoin a negative to this affirmative.

To the Sixth.

11. All flame is more or less hot, nor can any negative be subjoined to it. And yet they say that the Ignis Fatuus, as it is called, which is sometimes projected on a wall, has not much heat; perhaps it is like the flame of spirit of wine, which is mild and gentle. But that flame seems to be still more mild, which, according to some trustworthy and weighty histories, is said to have appeared round the heads and hair of boys and virgins, without singeing their hair in the slightest degree, but flickering gently around it. And it is most certain that a kind of coruscation, unaccompanied by manifest heat, has appeared around a sweating horse when journeying in the night-time during fine weather. And a few years ago it was a matter very much remarked upon, and considered as a miracle, that the apron of a certain girl gave forth sparks when slightly shaken or rubbed; but perhaps this was caused by alum or some other salt in the dye of the apron, which adhered to it more thickly than usual, so as to form a crust, which was broken in the rubbing. And it is most certain that all sugar, whether candied or raw, if it be sufficiently hard, emits sparks when broken or scraped with a knife in the dark. In like

manner sea and salt water is sometimes found to sparkle in the night when forcibly struck by the oars. Again, during nights when the sea is agitated by violent tempests, the foam is observed to sparkle, and this sparkling the Spaniards call "the Lungs of the Sea." And sufficient inquiry has not been made as to the nature of the heat contained in that flame which the sailors of old called "Castor and Pollux," and the moderns "St. Elmo's fire."

To the Seventh.

12. Everything ignited so as to turn to a fiery redness, though unaccompanied by flame, is invariably hot ; there is no negative to this affirmative ; but rotten wood seems to come nearest to it, for it shines by night, and yet is not found to be hot ; and the putrescent scales of fish, for they also shine by night, and yet are not found to be warm to the touch ; nor indeed are the bodies of glowworms, nor the fly which they call *luciola*, found to be warm to the touch.

To the Eighth.

13. Sufficient inquiry has not been made as to the position and nature of the soil from which hot baths usually spring, and so no negative is subjoined.

To the Ninth.

14. To warm liquids is subjoined as a negative the peculiar nature of liquid itself. For there is found no tangible liquid which is hot in its own nature and remains so constantly ; but heat is superinduced for a time only, as an adventitious nature ; so that those things which in power and operation are hottest, as spirit of wine, chemical aromatic oils, oil of vitriol and sulphur, and the like, which burn after a while, are at first cold to the touch. Now the water of natural baths, taken up in a vessel and separated from its source, cools down like water heated by fire. But it is true that oily bodies are a little less cold to the touch than watery ones, oil being less cold than water, and silk than linen. But this belongs to the Table of Degrees of Cold.

To the Tenth.

15. In like manner is subjoined, as negative to hot vapour, the nature of vapour itself, as it is found among us. For exhalations from oily matters, though they are easily inflammable, are yet not found to be hot, unless recently exhaled from a hot body.

To the Tenth.

16. In like manner the nature of air itself is subjoined as a negative to hot air. For air is not found with us to be hot, unless it be either shut up or compressed, or manifestly heated by the sun, by fire, or by some other hot body.

To the Eleventh.

17. As negative we have subjoined seasons which are colder than

is warranted by the time of year, as is the case when the east or north wind blows ; just as seasons of an opposite character occur when the south and west winds prevail. So a tendency to rain (especially during winter) accompanies a warm season ; while, on the other hand, frost accompanies cold weather.

To the Twelfth.

18. Is subjoined, as negative, air confined in caverns during summer. But concerning confined air a diligent inquiry must by all means be made. For, in the first place, doubt arises, and not without cause, as to what is the nature of air, as regards heat and cold, in its own proper nature. Now air receives its heat from the impression of the heavenly bodies, and its cold perhaps from the evaporation of the earth ; and again in the mid region of the air (as it is called) from cold vapours and snows, so that no opinion can be formed as to the nature of air from the examination of portions of it which are at large and exposed, but a truer judgment might be formed by examining it when confined. But it is also necessary that the air should be confined in a vessel of such material as shall neither itself imbue the air with heat or cold of its own nature, nor easily admit the influence of the external atmosphere ; and therefore let experiment be made in an earthen jar wrapped in several folds of leather to protect it from the external air ; let it remain for three or four days in a vessel carefully closed ; and on the opening of the vessel, the result may be tested either by the application of the hand, or by means of a glass properly graduated.

To the Thirteenth.

19. There exists a similar doubt whether the warmth in wool, skins, feathers, and the like, arises from some slight degree of heat inherent in them, inasmuch as they are animal excretions, or from a certain fatness and oiliness, which is of a nature akin to warmth, or simply from the confinement and separation of the air, as was mentioned in the last article. For all air, when cut off from communication with the external atmosphere, seems to have in it some warmth. And so let experiment be made on fibrous substances made of linen, but not of wool, feathers, or silk, which are animal excretions. It must also be remarked that all powders (in which air is clearly enclosed) are less cold than the bodies before they are pulverized, as also we think that all foam (as containing air) is less cold than the liquid itself.

To the Fourteenth.

20. To this no negative is subjoined. For nothing is found among us, either tangible or spiritual, which when put to the fire does not take up heat. There is, however, this difference, that some things take up heat more quickly, as air, oil, and water ; others more slowly, as stone and metals. But this belongs to the Table of Degrees.

To the Fifteenth.

21. The only negative subjoined to this Instance, is that it should

be carefully noted that sparks are not elicited from flint and steel, or any other hard substance, except when some particles are struck out of the substance of the stone or metal; and that the attrition of air itself never generates sparks, as it is commonly thought; and moreover that these sparks themselves, owing to the weight of the ignited body, tend downward, rather than upwards, and on extinction turn into a kind of sooty matter.

To the Sixteenth.

22. There is, we think, no negative subjoined to this Instance. For no tangible body is found among us which does not clearly grow hot under attrition, insomuch that the ancients imagined that the heavenly bodies possessed no other power or means of generating heat than the attrition of the air during their rapid and energetic rotation. But under this head it must be further inquired whether bodies discharged from machines (as cannon-balls) do not contract some degree of heat from the percussion thereof, so as, after they have fallen, to be found somewhat hot. But air in motion cools rather than heats, as in the case of wind, blowing with bellows, and from the partially closed mouth. But motion of this kind is not sufficiently rapid to excite heat, and acts throughout the whole body, and not by particles, so that it is not wonderful that it does not generate heat.

To the Seventeenth.

23. About this Instance a more diligent inquiry must be made. For herbs and green and moist vegetables seem to have in them some latent heat. But this heat is so slight as not to be perceived by the touch when they are single, but only when they are collected and confined, so that their spirits cannot escape into the air, but rather cherish each other: whence there arises manifest heat, and sometimes flame, in suitable matter.

To the Eighteenth.

24. About this Instance also a more diligent inquiry must be made. For it appears that quick-lime, when sprinkled with water, conceives heat, either from the condensation of the heat which was previously dispersed (as was mentioned above in the case of confined herbs), or from the irritation and exasperation of the fiery spirit by the water, so as to occasion a kind of conflict and reaction. But which is the real cause will appear more readily if oil be substituted for water. For oil will serve as well as water to combine the enclosed spirit, and will not irritate it. Moreover the experiment must be extended over a wider field, by calling into use the ashes and cinders of different bodies, and by applying different liquids.

To the Nineteenth.

25. To this Instance is subjoined the negative of other metals which are softer and more reducible. For gold leaf, dissolved by means of *aqua regia*, gives out no heat to the touch during solution; nor does

lead dissolve in *aqua fortis*; nor, indeed, does quicksilver (as we remember); but silver itself does in a slight degree, and copper also (as we remember), and tin more manifestly; and most of all iron and steel, for they not only excite a strong heat in the process of dissolution, but a violent ebullition also. Heat appears, therefore, to be originated by conflict, when strong waters penetrate, and pierce, and tear asunder the parts of a body, and the body itself resists. But when bodies yield more easily, scarcely any heat is excited.

To the Twentieth.

26. To the heat of animals no negative is subjoined, unless it be that of insects (as has been said), on account of the smallness of their bodies. For in fishes, as compared with land animals, it is rather the low degree than the absence of heat that is noted. But in vegetables and plants no degree of heat is perceived by the touch, nor in their exudations, nor in their pith, when recently laid bare. But in animals there is found a great diversity of heat, both in their parts (the degree of heat differing at the heart, in the brain, and at the surface) and in their accidents, as in vehement exercise and fevers.

To the Twenty-first.

27. To this Instance scarcely any negative is subjoined. Moreover the stale excrements of animals have evidently a potential heat, as is seen in the fattening of the soil.

To the Twenty-second and Twenty-third.

28. Liquids (whether they go by the name of water or of oil) which possess a great and intense acidity, imitate the operation of heat in the disruption of bodies, and after a time in burning them, and yet to the touch they are not hot at first. But they operate relatively, and according to the porosity of the body to which they are applied. For *aqua regia* dissolves gold, but does not touch silver, while on the other hand *aqua fortis* dissolves silver, but does not touch gold; and neither of them dissolves glass, and so of the rest.

To the Twenty-fourth.

29. Let experiment be made as to the action of spirit of wine on wood, and also on butter, wax, or pitch, if it will melt them in any degree by its heat. For the twenty-fourth Instance shows its power of imitating heat in producing incrustations. And let an experiment be made in like manner in the case of liquefactions. Let experiment be also made by means of a graduated glass or thermometer, concave on the outside at the top, by pouring highly rectified spirit of wine into the concavity, and covering it over that it may better retain its heat; and note if it makes the water descend by its heat.

To the Twenty-fifth.

30. Spices and pungent herbs are felt to be hot to the palate, much more so when taken internally. And so it must be seen on what

other materials they produce the effects of heat. Sailors state that when bundles and masses of spices, which have been shut up for a long time, are suddenly opened, those who first disturb and take them out stand in danger of fevers and inflammations. In like manner it may be tried whether spices and herbs of this kind, when powdered, would not dry bacon and meat, hung over them, as smoke does.

To the Twenty-sixth.

31. There is an acidity or penetrating power in cold substances, as vinegar and oil of vitrol, as well as in hot, as oil of marjoram and the like. And so they equally excite pain in animated bodies, and disintegrate and destroy the parts of inanimate substances. Therefore to this Instance no negative is subjoined. But in animated bodies no pain is found to exist without a certain sensation of heat.

To the Twenty-seventh.

32. Heat and cold have very many actions in common, though in a very different manner. For snow seems after a while to burn children's hands, and cold preserves flesh from putrefaction, no less than fire; and heat contracts bodies into a smaller bulk, as also does cold. But it is more convenient to refer these and similar instances to the inquiry concerning cold.

xiii. Thirdly, we must make a *Presentation to the Intellect* of Instances in which the Nature under inquiry exists in different degrees, more or less, either by comparing its increase and decrease in the same subject, or by instituting a comparison of its amount in different subjects by turn. For since the Form of a thing is the very thing itself, and since a thing differs from its Form only as the apparent differs from the actual, the external from the internal, or that which is referred to man from that which is referred to the universe; it necessarily follows that no Nature can be received as the true Form, unless it decreases invariably when the Nature itself decreases, and in like manner invariably increases when the Nature itself increases. And so we have usually called this table *The Table of Degrees*, or *The Table of Comparison*.

Table of Degrees or Comparison in Heat.

We shall therefore first speak of those substances which have no degree of heat at all perceptible to the touch, but which seem to have a certain potential heat, or disposition and preparation for warmth. Afterwards we shall descend to Instances which are hot actually, or to the touch, and to their intensities or degrees.

1. Among solid and tangible bodies we find nothing which is in its own Nature originally hot. For there is no stone, metal, sulphur, fossil, wood, water, nor corpse of any animal, which is found to be hot. And hot waters in baths seem to attain their heat accidentally, either through the agency of flame or subterranean fire, such as is vomited forth by *Ætna* and many other mountains, or from the conflict of bodies, as heat is caused in the solution of iron and tin. And so there

is no degree of heat in inanimate things perceptible to the human touch ; but yet they differ in degree of cold, for wood and metal are not equally cold. But this belongs to the Table of Degrees in Cold.

2. As regards potential heat and preparation for flame, very many inanimate substances are found to be very much disposed thereto, as sulphur, naphtha, petroleum.

3. Substances which were once hot, such as horse-dung, or lime, or perhaps ashes, and soot, retain some latent remnants of their former heat. And so certain distillations and separations of bodies are brought about by burying them in horse-dung, and heat is excited in lime by sprinkling it with water, as has been already said.

4. Among vegetables we do not find any plant, or part of a plant (as gum or pith), which is hot to the human touch. But yet (as has been said above) green herbs, when shut up together, gather heat ; and some vegetables are found to be hot, and others cold to the internal touch, as to the palate, or the stomach, or even, after a little time, to the external parts, as in the case of plasters and ointments.

5. In the parts of animals, after death or separation, we find nothing hot to the touch. For horse-dung itself does not retain heat, unless it be confined and buried. But yet all dung seems to have a potential heat, as appears in the fertilizing of land. And in like manner the corpses of animals have some such latent and potential heat, so that in grave-yards where burials take place daily, the earth contracts a kind of hidden heat, which consumes any corpses recently interred far more quickly than pure earth. And it is said that among the Orientals a certain thin and soft web has been discovered, prepared from the plumage of birds, which, by an innate power, dissolves and liquefies butter when lightly wrapped up in it.

6. Fertilizing substances, such as dung of all kinds, chalk, sea-sand, salt, and the like, have some disposition to heat.

7. All putrefaction has in it certain elements of slight heat, though not sufficient to be perceptible to the touch. For not even those substances which by putrefaction turn to animalculæ, such as flesh, or cheese, are perceptibly hot ; nor is rotten wood, which shines at night, found to be hot to the touch. But the heat of putrid matter sometimes betrays itself by foul and strong smells.

8. And so the first degree of heat, among those substances which feel hot to the touch, seems to be the heat of animals ; and this has great latitude in its degrees, for the lowest degree (as in insects) is scarcely felt by the touch ; but the highest scarcely reaches to the degree of heat possessed by the sun's rays in the warmest regions and seasons, nor is it too severe to be born by the hand. And yet they relate of Constantius, and some others of a very dry constitution and habit of body, that when attacked by very acute fever, they became so hot as to seem almost to burn a hand placed on them.

9. Animals increase in heat by motion and exercise, by wine and feasting, by desire, by raging fevers, and by pain.

10. Animals, when attacked by intermittent fevers, are seized at first with cold and shivering, but after a while grow extremely hot ;

and the same is the case from the beginning in burning and pestilential fevers.

11. Let further inquiry be made as to the comparative heat in different animals, as fishes, quadrupeds, serpents, birds ; and also with reference to their species, as in the lion, the kite, the man ; for in common opinion fishes are least hot internally, birds most so ; especially doves, hawks, ostriches.

12. Let further inquiry be made concerning the comparative heat in different parts and members of the same animal. For milk, blood, seed, eggs, are found to be moderately warm, and less hot than the outer flesh of the animal when in motion or agitated. But what is the degree of heat in the brain, stomach, heart, and other parts, has not yet been in like manner investigated.

13. All animals in winter and cold weather become cold externally, but internally they are thought to be even hotter.

14. The heat of the heavenly bodies, even in the hottest regions, and at the hottest times of the year and day, does not attain power enough to inflame or burn either the driest wood or straw, or even tinder, unless it be strengthened by burning mirrors ; but yet it can extract vapour out of moist substances.

15. According to the report of astronomers, some stars are hotter than others. For among the Planets, after the Sun, Mars is set down as the hottest, then comes Jupiter, and then Venus ; among the cold are reckoned the Moon, and, above all, Saturn. And among the fixed stars, Sirius is accounted hottest, then *Cor Leonis*, or *Regulus*, then *Canicula*, &c.

16. The Sun gives out more heat in proportion as it approaches the perpendicular or zenith, and this may be held to be the case with the other Planets also in their degrees of heat ; for example, Jupiter gives us more heat when he is situated in Cancer or Leo, than when in Capricorn or Aquarius.

17. We must believe that the Sun itself and the other Planets give out greater heat in perigee, on account of their propinquity to the earth, than in apogee. But if it happens that in any region the Sun is in perigee, and at the same time near to the perpendicular, he must necessarily give more heat than in a region where he is also in perigee, but more oblique. So that a comparison of the altitude of planets ought to be noted, as they are more perpendicular or oblique in different regions.

18. The Sun, and the other Planets likewise, are thought to give more heat when near the larger fixed stars ; thus, when the Sun is in Leo he is nearer *Cor Leonis*, *Cauda Leonis*, *Spica Virginis*, *Sirius*, and *Canicula*, than when he is in Cancer, although he then is more perpendicular. And it is to be believed that those quarters of the heavens shed the greatest heat (although not perceptible to the touch) which are the most plentifully adorned with stars, especially the larger ones.

19. To sum up, the heat of the Heavenly Bodies is increased in three ways, viz., by perpendicularity, by propinquity or perigee, and by conjunction or combination of stars.

20. A very great interval is found to exist between the heat of animals and even of the rays of the heavenly bodies (as they come to us), on the one hand, and flame, though of the mildest kind, and all ignited bodies, and liquids, and air itself, when highly heated by fire, on the other. For the flame of spirit of wine, which is especially rare when uncondensed, can still inflame straw, linen, or paper; which the heat of animals, or of the sun, can never do without the aid of burning lenses.

21. Now of Flame and Ignited Substances there are very many degrees as to strength and weakness of heat. But on these points no diligent inquiry has been made, so that we must perforce pass lightly by them. But among flames that of spirit of wine seems to be the mildest, unless, perchance, the *ignis fatuus*, and flames or coruscations arising from the perspiration of animals, be milder. Next to this we think, comes flame derived from vegetables which are light and porous, such as straw, reeds, and dry leaves; from which the flame of hair or feathers differs but little. Next, perhaps, comes flame from wood, especially those kinds which have not much resin or pitch, excepting that flame from small-sized wood (such as is commonly tied up in faggots) is gentler than that from the trunks and roots of trees. And this may be tried in the common furnaces for smelting iron, in which fire made with faggots and boughs of trees is not very useful. Next comes (as we think) flame from oil, tallow, wax, and such like oily and fatty substances, which have no great sharpness. But the strongest degree of heat is found in pitch and resin, and above all in sulphur, camphor, naphtha, petroleum, and salts (after their raw matter has been voided), and in their compounds, as gunpowder, Greek fire (which they commonly call wild fire), and its different kinds, which possess so obstinate a heat as not easily to be extinguished by water.

22. We think also that flame which results from some imperfect metals is very powerful and severe. But of all these let further inquiry be made.

23. The flame of destructive lightning appears to exceed all the foregoing, so that it has sometimes melted wrought iron itself into drops, a thing which these other flames cannot do.

24. In ignited substances, again, there are different degrees of heat, about which no diligent inquiry has been made. We think that the weakest heat is that arising from tinder, which we use to kindle flame, and likewise that of spongy wood, or fine dry tow, which is employed to fire cannon. Next to this comes ignited wood and coal, and also bricks heated to redness, and the like. But the most vehement heat we think to be that of ignited metals, such as iron, copper, &c. But concerning these, also, further inquiry must be made.

25. Some substances in a state of ignition are found to be far hotter than some kinds of flame. For ignited iron is much hotter and more consuming than the flame of spirit of wine.

26. Of those substances which are not ignited, but only heated by fire, as boiling water, and air shut up in reverberatories, some are found to surpass in heat many flames and ignited substances.

27. Motion increases heat, as we see in the case of bellows and the blast ; insomuch that the harder metals are not melted or liquefied by means of a dull or quiet fire, unless it be quickened by a blast.

28. Let experiment be made by means of burning lenses, which (as we remember) operate thus : if a lens be placed (suppose) a span distance from the combustible object, it does not kindle or inflame it so readily as it would if it were placed at the distance of (say) half a span, and then moved gradually and slowly to the distance of a span. Yet the cone and union of the rays are the same, but the motion itself increases the operation of the heat.

29. Those conflagrations which take place when a strong wind is blowing are thought to make greater progress against the wind than with it, because flame recoils with a swifter motion when the wind slackens, than that with which it advances while the wind is driving it on.

30. Flame does not burst forth, nor is it produced, unless it has some hollow space in which to move and play ; except the explosive flame of gunpowder, and the like, where compression and imprisonment of the flame increases its fury.

31. The anvil becomes very hot under the hammer, so that were the anvil to consist of a rather thin plate, we imagine it would, under strong and continued blows of the hammer, become red hot, like ignited iron ; but of this let experiment be made.

32. But in the case of ignited bodies which are porous, and which give space for the fire to move, if this motion be restrained by strong compression, the fire is immediately extinguished ; as when tinder, or the burning wick of a candle or lamp, or even burning charcoal, or coal, is compressed by pincers, or by treading with the foot, or the like, the action of the fire immediately ceases.

33. Approximation to a hot body increases heat in proportion to the degree of approximation ; and this is also the case with light, for the nearer an object is brought to the light, the more visible it becomes.

34. The union of different heats increases heat, unless the bodies themselves be mingled. For a great fire and a little fire in the same place increase one another's heat, but tepid water poured into boiling water cools it.

35. The continued presence of a hot body increases heat. For the heat continually passing through and flowing forth from it, mingles with the previously existing heat, so as to multiply it. A fire does not heat a chamber in half an hour so well as it would if it had been burning a whole hour. But this is not the case with light, for a lamp or a candle gives no more light after burning for some time than it did when first lighted.

36. Irritation caused by surrounding cold increases heat, as we may see in fires during a sharp frost. And this, we think, is due not only to the confinement and contraction of the heat, which is a kind of union, but to exasperation ; thus when air or a stick is violently compressed or bent, it does not recoil to its former position, but goes further in the opposite direction. And so let trial be carefully made,

by putting a stick, or something of the kind, into flame, to see whether it be not burned more quickly at the sides than in the middle of the flame.

37. Now there are very many degrees in susceptibility of heat ; and, first of all, it must be remarked how small and trifling a heat changes, and to a certain degree warms, even those bodies which are least susceptible of it. For the heat of the hand imparts some heat to a bullet of lead or any other metal, when it has been held in it a little while. So easily and universally is heat transmitted and excited, without the body undergoing any apparent change.

38. Air takes up and gives off heat more easily than any other body known to us, as is best seen in heat glasses. They are constructed thus : take a glass with a hollow belly, and a long narrow neck ; turn it upside down, and insert it, mouth downwards and belly upwards, into another glass vessel containing water, so that the mouth of the upper vessel touches the bottom of the receiver ; let the neck of the inserted glass rest a little on the mouth of the receiver, so that it may stand steadily ; and that this may be done more conveniently, apply a little wax to the mouth of the receiver, taking care not to close it entirely, lest the motion, of which we are now about to speak, and which is very subtle and delicate, be impeded for want of a supply of air.

Now the inverted glass, before it is introduced into the other, should have its upper part, *i.e.*, its belly, heated at the fire. Then, when the heated glass has been placed as we have directed, the air which was expanded by the heat will draw itself back and contract after a delay sufficient to allow for the extinction of the adventitious heat to the same extension or dimension as that of the surrounding air at the time of the insertion of the glass, and will draw up the water to a corresponding standard. Moreover there should be attached a long narrow slip of paper, graduated at pleasure. Then you will see that, as the temperature of the day rises with heat, or falls with cold, the air contracts in like manner ; and this will be rendered conspicuous by the ascent of the water when the air is contracted, and by its descent or depression when it is dilated. Now the sensibility of air to heat and cold is so subtle and exquisite, as far to exceed the power of human touch ; so that a ray of sunlight, or the heat of the breath, and, much more, the heat of the hand, falling on the top of the glass, immediately depresses the water to a perceptible degree. But yet we think that the spirit of animals has a still more exquisite sense of heat and cold, only that it is hindered and rendered dull by the mass of their bodies.

39. Next to air we think that those bodies are most sensitive of heat which have been recently changed and compressed by cold, such as snow and ice, for they begin to be dissolved and liquefied by any gentle warmth. Next to them probably comes quicksilver ; after this come fatty bodies, such as oil, butter, and the like ; then wood, then water. Lastly, stones and metals, which do not readily admit of heat, especially internally. These, however, when they have once acquired heat, retain it for a very long time ; so that if brick or stone, or iron

in a state of ignition, be plunged into a basin of cold water, will for a quarter of an hour (more or less) retain so much heat as to render it impossible to touch them.

40. The less the mass of a body, the more quickly it becomes heated by the approximation of a hot body ; and this shows that all the heat which we possess is in some way opposed to tangible matter.

41. Heat, as regards sense and touch, is variable and relative ; so that warm water feels hot to a hand which is previously cold, but cold if the hand be hot.

xiv. How deficient we are in History any one will easily see from the above tables, in which we not only sometimes insert traditions and reports (always, however, accompanied by a mark of doubtful credit and authority) in place of approved History and certain Instances, but are also very frequently obliged to make use of the expressions, " Let experiment be made," or " Let it be further inquired."

xv. And the work and office of these three tables we usually call *Presentation of Instances to the Understanding*. Now, when *Presentation* has been made, *Induction* itself must be put into operation. For we have to find, on *Presentation* of all and each of the Instances, such a Nature as shall be always present when the given Nature is present, and absent when it is absent ; as shall increase and decrease with it, and be (as has been said above) a limitation of a more common Nature. Now, if the mind tries to do this affirmatively from the beginning (which she will always do when left to herself), there will rise up phantasms, and questions of opinion, and notions ill defined, and Axioms requiring emendation from day to day ; unless we choose (like the Schoolmen) to contend for what is false. Still, they will undoubtedly be better or worse according to the faculties and strength of the Understanding which is engaged on them. It belongs, most certainly, to God (the Giver and Maker of Forms), and perhaps also to Angels and Intelligences, to know Forms immediately and affirmatively at the very outset of their contemplation. But this assuredly is far beyond the reach of man ; to whom it is granted only to proceed at first by negatives, and at last to end in affirmatives, after every kind of Exclusion has been tried.

xvi. And so a complete solution and separation of Nature must be made ; not by means of fire, indeed, but by the mind, as if it were a divine fire. And thus the first work of true *Induction* (as far as relates to the discovery of Forms) is the *Rejection* or *Exclusion* of the several Natures, which are not found in some Instance where the given Nature is present, or which are found in some Instance where the given Nature is absent, or which are found to increase in some Instance when the given Nature decreases, or to decrease when the given Nature increases. Then indeed, after *Rejection* and *Exclusion* have been duly made, there will remain in the second place, as it were at the bottom (light opinions going off like smoke), a Form affirmative, solid, true, and well defined. And this, though easily spoken, is only arrived at after many failures. Now we shall try to omit nothing which may help us towards it.

xvii. But while we seem to attach so much importance to Forms, we cannot too often caution and admonish our readers against applying our remarks to those Forms to which the contemplations and thoughts of men have hitherto been accustomed.

For, in the first instance, we do not at present speak of copulative Forms, which are (as we have said) combinations of simple Natures according to the common course of the universe, as of a lion, an eagle, a rose, gold, and the like. For it will be time to treat of these when we come to *Latent Processes* and *Latent Structures*, and their discoveries, as they are found in what are called concrete Substances or Natures.

Nor, again, should what we say be understood (even as regards simple Natures) of abstract Forms and Ideas, either undetermined or badly determined in matter. For when we speak of Forms, we mean nothing more than those laws and determinations of pure action which ordain and constitute any simple Nature; as Heat, Light, Weight, in every kind of susceptible matter and subject. And so the Form of Heat or of Light is the same thing as the Law of Heat or of Light; nor, indeed, do we ever withdraw or retire from things themselves and their practical side. Wherefore, when we say (for example), in an inquiry into the Form of Heat, "reject rarity," or "rarity is not part of the Form of Heat," it is the same thing as if we were to say "man can superinduce heat in a dense body;" or, on the other hand, "man can take away or keep off heat from a rare body."

But if any one should think that our Forms are somewhat abstract, in that they combine and join what is heterogeneous (for the heat of heavenly bodies and the heat of fire seem to be very heterogeneous, as also do the fixed red in a rose, or the like, and the apparent red in the rainbow, in the rays of the opal or of the diamond; so, again, do death by drowning, by hanging, by stabbing, by apoplexy, by atrophy, and the like; and yet they agree in the Nature of heat, redness, and death), let him recollect that his understanding is held captive by custom, by generalities, and by opinions. For it is most certain that these things, however heterogeneous and distinct, agree in that Form or Law which ordains heat, or redness, or death, and that the power of man cannot be emancipated and set free from the common course of Nature, and expanded and exalted to new efficient and methods of operating, except by the revelation and discovery of Forms of this kind. And yet, after discussing that union of Nature which is the most important point, we shall go on to speak afterwards, in their proper place, of the divisions and veins of Nature, as well those that are ordinary as those that are more inward and exact.

xviii. But now we must set forth an example of the *Exclusion* or *Rejection* of Natures, which, by the *Tables of Presentation*, are found not to be of the Form of Heat; meanwhile calling to mind that not only is each Table sufficient for the rejection of any Nature, but even any one of the Individual Instances contained in the Tables. For it is manifest, from what has been said, that any one *Contradictory Instance* is fatal to a conjecture as to the Form. But nevertheless, for

the sake of clearness, and that the use of the Tables may be shown more distinctly, we sometimes double or repeat an exclusion.

Example of Exclusion or Rejection of Natures from the Form of Heat.

1. By the Sun's Rays, *reject* elementary Nature.
 2. By Common Fire, and especially by Subterraneous Fire (which is most remote, and most completely cut off from the Rays of heavenly Bodies), *reject* heavenly Nature.
 3. By the heating of all kinds of Bodies (*i.e.*, minerals, vegetables, outer parts of animals, water, oil, air, and the rest) on mere approximation to a fire, or other hot body, *reject* all variety or more subtle texture of bodies.
 4. By Ignited Iron and other Metals which heat other bodies, and yet are not at all diminished in weight or substance, *reject* the communication or admixture of the substance of another hot body.
 5. By boiling Water and Air, and even by Metals and other solid Bodies when heated, but not to the point of ignition or red heat, *reject* light and illumination.
 6. By the Rays of the Moon and other luminaries (except the Sun), *reject* also light and illumination.
 7. By the *Comparison* of Ignited Iron, and the Flame of Spirit of Wine (of which ignited iron has more heat and less light, and the flame of spirit of wine more light and less heat), *reject* also light and illumination.
 8. By Ignited Gold and other Metals which are most dense, when taken as a whole, *reject* rarity.
 9. By Air, which is found for the most part to be cold, and yet remains rare, also *reject* rarity.
 10. By Ignited Iron, which does not expand in bulk, but remains within the same visible dimensions, *reject* also local or expansive motion in the whole.
 11. By the dilatation of Air in heat-glasses and the like, wherein it manifestly moves locally and expansively, and yet acquires no sensible increase of heat, *reject* also local or expansive motion of the whole as a body.
 12. By the facility with which all Bodies are heated without any destruction or remarkable alteration, *reject* a destructive Nature, or the violent communication of any new Nature.
 13. By the agreement and conformity of the similar effects produced by Heat and Cold, *reject* both expansive and contractile motion in the whole.
 14. By the kindling of Heat from the attrition of bodies, *reject* a principal Nature; and by principal Nature we mean that which is found to exist positively in Nature, and is not caused by a preceding Nature.
- There are also other Natures; for the Tables which we construct are not perfect, but only examples.

All and each of the aforesaid Natures are not of the Form of Heat; and from all of them man is freed when operating on heat.

xix. In the process of Exclusion are laid the foundations of true *Induction*, which, however, is not perfected until it rest in the affirmative. Nor is the Exclusive Part itself in any way complete, nor can it be so in the beginning ; for the *Exclusive* Part is evidently a *Rejection* of simple Natures. But if we have not as yet good and true conceptions of simple Nature, how can the process of Exclusion be made correctly ? Now, some of the above-mentioned notions (as that of elementary Nature, of heavenly Nature, of Rarity) are vague and badly defined. And so we, being neither ignorant nor forgetful how great a work we are attempting (viz. that of rendering the human understanding a match for things and Nature), by no means rest contented with what we have already enjoined ; but proceed further to contrive and supply stronger aids for the use of the Understanding ; which we will now subjoin. And, certainly, in the *Interpretation of Nature* the Mind should by all means be so prepared and formed, as both to sustain itself in the proper degrees of certainty, and yet remember (especially in the beginning) that what it has before it depends very much on what remains behind.

xx. But yet, since truth emerges more quickly from error than from confusion, we think it expedient that the Understanding should be allowed, when the Three Tables of *First Presentation* (such as we have laid down) have been made and weighed, to address itself to the work of *Interpreting Nature* in the affirmative, by the aid both of the Instances given in the Tables and of those which occur elsewhere. And this kind of attempt we usually call *The Permission of the Intellect*, or *The Commencement of Interpretation*, or *The First Vintage*.

First Vintage of the Form of Heat.

It must be observed that the Form of a thing (as is clear from what has been said) exists in each and all the Instances in which the thing itself exists, for otherwise it would be no Form ; and so, evidently, no contradictory Instance can be allowed. And yet the Form is found to be far more conspicuous and evident in some Instances than in others ; in those, namely, wherein the Nature of the Form is less coerced and hindered and reduced to order by means of other Natures. And Instances of this kind we usually call *Glaring, or Ostensive Instances*. And thus we must proceed to the First Vintage of the Form of Heat.

From these Instances, viewed altogether and individually, the Nature, of which heat is the limitation, seems to be Motion. Now, this is displayed most of all in flame, which is in perpetual motion, and in hot and boiling liquids, which also are always in motion. And it is displayed again in the excitement or increase of heat by motion, as by bellows and wind ; for which see *Instance 29, Table 3*. And similarly in other modes of motion, for which see *Instances 28 and 31, Table 3*. Again, it is displayed in the extinction of fire and heat by all strong compression which checks and stops motion ; for which see *Instances 30 and 32, Table 3*. It is also shown by the fact that every

body is destroyed, or at least remarkably altered, by all strong and vehement fire and heat. Whence it is quite clear that heat causes tumult and perturbation, and brisk motion in the internal parts of the body, which perceptibly tends to its dissolution.

But when we say of motion that it stands in the place of a *genus* to heat, we mean to convey not that *heat* generates *motion*, or *motion* *heat* (although even both may be true in some cases), but that essential heat, or the "quid ipsum" of heat, is Motion and nothing else; limited, however, by *Differences*, which we shall presently subjoin, when we have added some cautions for the avoiding of ambiguity.

Heat, as regards the senses, is a relative thing, and bears relation to man, and not to the universe, and is rightly defined as merely the effect of heat on animal spirit; moreover, it is in itself a variable thing, for the same body (as the senses are predisposed) induces a perception both of heat and cold, as is clear from *Instance* 41, *Table* 3.

Nor indeed ought the communication of heat, or its transitive Nature, by which a body grows hot when applied to a hot body, to be confounded with the Form of Heat, for heat is one thing and heating another. Heat is induced by motion of *attrition*, without any preceding heat; whence heating is excluded from the Form of Heat. And even when heat is produced by the approximation of a hot body, this is not the result of the Form of Heat, but depends altogether on a higher and more common Nature, viz. on the Nature of assimilation or self-multiplication; a subject into which a separate inquiry must be made.

Again, our notion of fire is popular and worthless; for it is made up of the combination of heat and light in any body, as in common flame and bodies heated to redness.

And so, all ambiguity being removed, we must at length come to true *Differences*, which limit motion, and constitute it the Form of Heat.

The *First Difference* then is this; that heat is an expansive motion, by which a body strives to dilate and to betake itself into a larger sphere or dimension than it previously occupied. This *Difference* is most strongly displayed in flame, when smoke or thick vapour manifestly dilates and opens itself into flame.

It is shown also in all boiling liquids, which manifestly swell, rise, and bubble, and continue the process of self-expansion until they are changed into a far more extended and diluted body than the liquid itself, viz. in vapour, smoke, or air.

It is shown also in all wood and combustible matter, where exudation takes place sometimes, but evaporation always.

It is shown also in the melting of metals, which (being of compact texture) do not easily swell and dilate themselves; but yet their spirit, being itself dilated, and so imbibing a desire for further dilation, forces and drives the grossest parts into a liquid state. But if the heat be much intensified, it dissolves and changes much of their substance into vapour.

It is shown also in iron or stones, which, although not liquefied or fused, are yet softened. This is also the case with wooden sticks, which become flexible when heated for a short time in hot ashes.

But that motion is best seen in the case of air, which continuously and manifestly dilates with a slight heat ; as is seen from *Instance 38, Table 3*.

It is shown also in the contrary Nature of Cold. For cold contracts all bodies, and forces them into a narrower space ; so that during intense cold nails fall out of the walls, brazen vessels split, and glass, when heated and suddenly placed in the cold, cracks and breaks. In like manner, air is contracted by slight chills, as is seen from *Instance 38, Table 3*. But of this we shall speak more at large in our inquiry concerning cold.

Nor is it wonderful that heat and cold exhibit very many actions in common (for which see *Instance 32, Table 2*), when two of the following *Differences* (of which we shall speak presently) are found to suit either Nature ; though in the *Difference* (of which we are now speaking) their actions are diametrically opposed. For heat gives an expansive and dilating, cold a contracting and combining motion.

The *Second Difference* is a modification of the first, viz. that heat is a motion expansive (or tending towards the circumference), but with this condition, that the body tends upwards with it. For without doubt there are very many kinds of mixed motion ; e.g., an arrow or a dart rotates at the same time that it proceeds, and proceeds as it rotates. In like manner, the motion of heat is at once an expansive motion and a motion upwards.

And this *Difference* is shown by putting a pair of tongs or an iron rod into the fire ; for if it be inserted perpendicularly, and held by the top, it quickly burns the hand ; but if horizontally, or from below, much more slowly.

It is also conspicuous in distillation *peo descensorium*, which is used for the more delicate flowers, the scent of which easily escapes. For industry has discovered the plan of placing the fire above instead of below, that it may burn less. For not only flame tends upwards, but all heat also.

Now, let an experiment be made with regard to this fact on the contrary Nature of Cold, viz. whether cold does not contract a body in a downward, just as heat dilates it in an upward direction. Take, therefore, two iron rods or tubes of glass, alike in all respects ; heat them a little, and then place a sponge full of cold water or a lump of snow under the one, and the same above the other. For we think that refrigeration will take place more quickly at the extremities of that stick upon which the snow is placed than at those of that under which it is placed ; the reverse of which is the case with heat.

The *Third Difference* is this : that heat is motion of expansion, not uniformly of the whole body, but in its lesser particles ; and at the same time restrained, repelled, and turned back, so that it assumes a

motion which is alternative and continually growing strong, and struggling, and irritated by reflection ; whence the fury of fire and heat has its origin.

This *Difference* is shown most of all in flame and boiling liquids, which are continually quivering and swelling up in small portions and subsiding again.

It is shown also in those bodies which are so closely compacted, as not to swell up or be dilated in mass when heated or ignited ; such as iron in a state of ignition, in which the heat is very fierce.

It is shown also in the fact that a fire burns most briskly in the coldest weather.

It is shown also in the fact that when air is expanded in a heat-glass, without impediment or repulsion (that is to say, uniformly and equally), no heat is perceived. And also in the case of wind which has been confined, though it breaks out with the greatest violence, still no remarkable heat is perceived, because the motion is of the whole, and without alternating motion in the particles. And on this point let experiment be made whether flame burns more fiercely towards the sides than in the middle.

It is shown also by the fact that all burning acts on minute pores of the body which is burned ; so that the burning undermines, penetrates, pricks, and goads the body, just as if an infinite number of sharp points were at work. And from this it also results, that all strong waters (when suited to the body on which they act) operate like fire, owing to their corrosive and pungent nature.

And this *Difference* (of which we now speak) is common also to the Nature of Cold ; in which the contractile motion is restrained by a resistance of expansion, just as in heat the expansive motion is restrained by a resistance of contraction.

And so, whether parts of a body penetrate towards the interior or towards the exterior, the principle is the same, although the strength put forth is very different ; because we have not here upon the surface of the earth anything which is intensely cold.

The *Fourth Difference* is a modification of the foregoing ; it is that this stimulating and penetrating motion must be somewhat rapid, and the reverse of sluggish, and must take place by particles, minute indeed, yet not of an extreme degree of subtlety, but a little larger.

This *Difference* is shown by comparing the effects of fire with those of time or age. For age or time dries, consumes, undermines, and reduces to ashes no less than fire, indeed with far more subtlety ; but because motion of this kind is very sluggish, and takes place through particles which are very delicate, no heat is perceived.

It is also shown by comparing the dissolution of iron with that of gold. For gold is dissolved without exciting heat, and the dissolution of iron takes place with accompaniment of vehement heat, although the time required for effecting it is nearly the same. This is because, in the case of the gold, the water of separation makes its entrance gently, insinuating itself with subtlety, and the particles of the gold yield

easily ; while in the case of the iron the entrance is made roughly, and is accompanied by a struggle, the parts of the iron possessing greater obstinacy.

It is shown also, to a certain extent, in some gangrenes and mortification of the flesh, which do not excite great heat or pain on account of the subtlety of the putrefaction.

And let this be the *First Vintage*, or *Commencement of Interpretation*, concerning the Form of Heat made by the *Permission of the Understanding*.

Now, from this *First Vintage* the Form, or true Definition of Heat (that, I mean, which bears relation to the universe, and is not merely relative to the senses) is described in a few words, thus : *Heat is motion expansive, restrained, and struggling through the lesser parts of a body.* And the expansion is modified ; *though expanding all ways, it yet has an upward direction.* Moreover, the struggle through the parts is also modified ; *it is not at all sluggish, but hurried, and accompanied with violence.*

And as regards the practical side, it is the same thing. For the designation is as follows : *If in any natural body you can excite motion of self-dilation or expansion, and can so repress that motion and turn it upon itself that the dilation shall not proceed equally, but shall gain ground in part, and be repelled in part, beyond doubt you will generate heat ;* not taking into consideration whether the body be elementary (as they say) or indued with celestial properties ; whether it be luminous or opaque ; rare or dense ; locally expanded, or contained within the bounds of its first dimension ; tending to dissolution, or remaining as it was ; whether it be animal, vegetable, or mineral ; whether it be water, oil, or air, or any other substance whatever susceptible of the motion aforesaid. And sensible heat is the same thing, but viewed with relation to the senses. But now we must proceed to further aids.

xxi. Having considered the *Tables of First Presentation and Rejection or Exclusion*, and having completed the *First Vintage* in accordance with them, we must advance to the other aids of the Understanding for the *Interpretation of Nature* and a true and perfect Induction. In preparing which we shall proceed, when tables are required, upon the Instances of Heat and Cold ; but where only a few examples are required, we shall proceed at large with other subjects, so as to keep our inquiry free from confusion, and yet not draw too closely the limits of our teaching.

We shall speak therefore, firstly, of *Prerogative Instances* ; secondly, of the *Supports of Induction* ; thirdly, of the *Rectification of Induction* ; fourthly, of the *Variation of Inquiry according to the Nature of the Subject* ; fifthly, of *Prerogative Natures*, with reference to Inquiry, or of what is to be inquired first, and what afterwards ; sixthly, of the *Limits of Inquiry*, or of the *Synopsis of all Natures in the Universe* ; seventhly, of *Deduction to Practice*, or of what exists relatively to man ; eighthly, of *Preparations for Inquiry* ; and lastly, of the *Ascending and Descending Scale of Axioms*.

xxii. Among *Prerogative Instances* we shall set forth first, *Solitary Instances*. Now, *Solitary Instances* are those which exhibit the Nature under investigation, in subjects which have nothing in common with other subjects except that same Nature ; or again, those which do not exhibit the Nature under investigation, in subjects which are similar to other subjects in every respect except in that same Nature. For it is manifest that Instances of this kind remove ambiguity, and accelerate and strengthen *Exclusion*, so that a few of them are as good as many.

For example ; in the inquiry as to the Nature of Colour : prisms, crystalline gems, which exhibit colours not only in themselves, but when cast externally on a wall, are *Solitary Instances*. So also are dews, &c. For they have nothing in common with the fixed colours of flowers, coloured gems, metals, wood, &c. except colour itself. Whence we easily collect that colour itself is nothing but a modification of the image of incident and refracted Light, arising, in the former case, from the different degrees of incidence ; in the latter, from the various textures and structures of the bodies. These *Instances*, then, are *Solitary* as regards resemblance.

Again, in the same investigation, the distinct veins of white and black in marble, and the variegations of colour in flowers of the same species, are *Solitary Instances* ; for the white and black of marble, and the white and purple spots in the flower of the pink, agree in almost every point except colour itself. Whence we easily gather that colour has not much to do with the intrinsic Natures of any body, but merely depends upon the groffer, and, as it were, mechanical arrangement of the parts. And these *Instances* are *Solitary* as regards difference. Both kinds we usually call *Solitary Instances*, or *Perinæ*, borrowing the term from the astronomers.

xxiii. Among *Prerogative Instances* we shall put in the second place, *Migrating Instances*. Those, we mean, in which the Nature under inquiry migrates towards generation, when it has not previously existed, or else migrates towards corruption when it has previously existed. And so in either such Instances are always twofold ; or rather one Instance in motion or transit is carried out to the opposite extreme. Instances of this kind not only accelerate and strengthen *Exclusion*, but also force the *Affirmative*, or the Form itself, into a narrow compass. For the Form of a thing must necessarily be something that is conferred by *Migration* of this kind ; or, on the contrary, removed and destroyed by it. And although every *Exclusion* promotes the *Affirmative*, yet this is more directly the case in the same subject than in different ones. Now, Form (as is clear from everything we have said), when it betrays itself in one case, leads to its discovery in all. And the simpler the *Migration*, the more valuable will be the *Instance*. Besides, *Migrating Instances* are of great use in practice ; for when they set forth the Form coupled with the Efficient or the Privative, they supply a clear direction for practice in some cases, whence the passage is easy to the cases that come next. There is, however, in these Instances a danger which requires

caution : viz. lest they should connect the Form too closely with the Efficient, and so fill the Understanding, or at least tinge it, with a false opinion concerning the Form, arising from the contemplation of the Efficient, which is always understood to be nothing more than the vehicle or bearer of the Form. But for this a remedy is provided, by means of an *Exclusion* legitimately carried out.

And we must now give an example of a *Migrating Instance*. Let the Nature inquired into be Whiteness. A *Migrating Instance* towards generation is glass, whole and powdered ; and similarly water, at rest and agitated into foam. For whole glass and plain water are transparent, not white ; whereas powdered glass and water in a state of foam are white, and not transparent. And so inquiry must be made as to what has happened to glass or water from this *Migration*. For it is clear that the Form of Whiteness is imparted and introduced by the pounding of the glass, and the agitation of the water. For we find nothing has been added, except the division of the glass and water into minute portions, and the introduction of air. And we have made no small advance towards discovering the Form of Whiteness, when we have found that two bodies in themselves transparent, more or less, (that is to say, air and water, or air and glass), if arranged together in minute portions, will exhibit Whiteness, by the unequal refraction of rays of light.

But in this matter we must also give an example of the danger and caution of which we have spoken. For here, doubtless, it will readily occur, to an Understanding which has been spoiled by Efficients of this kind, that air is always required to produce the Form of Whiteness, or that Whiteness is generated by transparent bodies only : notions which are altogether incorrect, and disproved by numerous exclusions. Whereas it will appear (air and the like being left out of the question) that bodies which are entirely even (in respect of those portions of them which affect vision) are transparent ; but that bodies which are uneven, with a simple texture, are white ; that bodies which are uneven, with a compound but regular texture, assume all colours except black ; but that bodies which are uneven, with a compound but very irregular and confused texture, are black. And so an example has now been given of a *Migrating Instance* towards generation in the required Nature of Whiteness. And a *Migrating Instance* towards corruption in the same Nature of Whiteness is found in foam, or in snow in a state of dissolution ; for the water loses its whiteness, and becomes transparent, on resuming its integral character and parting with its air.

Nor ought we by any means to overlook the fact that under the head of *Migrating Instances* should be comprehended not only those which migrate towards generation and loss, but those also which migrate towards increase and decrease, since they also tend to the discovery of the Form, as is sufficiently clear from the definition of Form given above, and from the *Table of Degrees*. Thus paper—which while dry is white, but when moistened (by the exclusion of air and introduction of water) is less white, and approaches nearer to

transparency—follows the same conditions as the Instances mentioned above.

xxiv. Among *Prerogative Instances* we shall put in the third place, *Ostensive Instances*, of which we have made mention in the *First Vintage concerning Heat*, and which we also call *Glaring*, or *Liberated and Predominating Instances*. They are those which show the Nature in question in its bare and substantive condition, and also in its exaltation, or highest degree of power, as being emancipated and freed from impediments, or at least triumphing over them, and by virtue of its influence suppressing and coercing them. For since every body contains in itself many copulate Forms of Natures in the concrete; it follows that they severally drive back, depress, break, and bind one another; and hence the individual Forms are obscured. But there are found some subjects in which the required Natures surpasses others in vigour, either through the absence of impediment, or the predominance of its own virtue. And *Instances* of this kind are the most *Ostensive* of Form. But in these *Instances* also we must be cautious to restrain the impetuosity of the Understanding. For whatever displays the Form, and seems to intrude it upon the Understanding, must be looked upon with suspicion, and recourse must be had to severe and diligent *Exclusion*.

For example: suppose the Nature inquired into to be Heat. The aerial heat-glass is an *Ostensive Instance* of the motion of expansion, which (as has been said above) is the principal part of the Form of Heat. For flame, though it manifestly exhibits expansion, yet, owing to its momentary extinction, does not display the progress of expansion. And hot water, owing to the easy transition of water into vapour and air, does not so satisfactorily display the expansion of water in its own body. Again, ignited iron, and the like, are so far from displaying this progress, that, from the repercussion and breaking up of their spirit by the compactness and density of their parts (which tame and bridle the expansion), the expansion itself is not at all conspicuous to the senses. But the heat-glass clearly shows expansion in air, and that, too, conspicuous, progressive, durable, and not transient.

To take another example: let the Nature inquired into be Weight. Quicksilver is an *Ostensive Instance* of Weight. For it surpasses everything in weight by a very long interval, except gold, and that is not much heavier. But quicksilver is a better Instance for indicating the Form of Weight than gold, because gold is solid and consistent, properties which seem to relate to density; but quicksilver is fluid, and charged with spirit, and yet it far exceeds in weight the diamond and those bodies which are thought to be the most solid. Whence it is demonstrated that the Form of Weight predominates simply in quantity of matter, and not in compactness of frame.

xxv. Among *Prerogative Instances* we shall put in the fourth place *Clandestine Instances*, which we also usually call *Twilight Instances*. They are as it were, opposed to *Ostensive Instances*. For they exhibit the Nature under investigation in its lowest degree of influence, and, so to speak, in its cradle and first rudiments, striving to make a sort of

first trial, but lying hid under a contrary Nature, and subdued by it. Now Instances of this kind are of very great service for the discovery of Forms ; because as *Ostensive Instances* lead easily to *Differences*, so *Clandestine Instances* are the best guides to *Genera*, i.e. to those common Natures of which the Natures in question are only limitations.

For example : let the Nature inquired into be Consistency, or Self-limitation, as opposed to Liquidity or Humidity. *Clandestine Instances* are those which exhibit some weak and feeble degree of constituency in a fluid ; as a bubble of water, which is a sort of consistent and limited pellicle, composed of the substance of water. In like manner we have droppings, which, if there be any water present to follow, draw themselves out into a very fine thread, to preserve the continuity of the water ; but if water be not present in sufficient abundance to follow, it falls in round drops, that being the figure which best preserves the water from solution of its continuity. But at the very instant when the thread of water breaks, and the drops begin to fall, the water itself recoils upwards to avoid solution of its continuity. Again, in metals, which when melted are liquid, but more tenacious, the molten drops often fly upwards and so remain. And something similar is to be found in the Instance of the mirrors made by children on reeds with spittle, where a consistent pellicle of water is also seen. But this is displayed much better in that other childish sport of taking water, made a little more tenacious by means of soap, and blowing into it through a hollow reed, so as to shape the water into a sort of castle of bubbles ; for it assumes sufficient consistency, by the introduction of air, to admit of being projected to some distance without breach of continuity. But this is seen best of all in froth and snow, which assume such consistency as almost to bear cutting with a knife, and yet they are formed out of air and water, both of which are liquid. All which examples clearly suggest that Liquidity and Consistency are only vulgar notions, and due to the senses ; and that, in fact, there exists in all bodies a tendency to avoid and escape a breach of continuity ; that in homogeneous bodies (such as liquids) it is weak and powerless, but in bodies which are composed of heterogeneous particles it is stronger and more energetic, because the approach of heterogeneous matter binds bodies together, while the introduction of homogeneous matter dissolves and relaxes them.

Similarly, let the Nature inquired into be the Attraction or Coition of bodies. The most remarkable *Ostensive Instance* of its Form is the Magnet. Now there is a contrary Nature to attraction, viz. non-attraction, which exists in a like substance. Thus iron does not attract iron, nor lead lead, nor wood wood, nor water water. But a *Clandestine Instance* is a Magnet armed with iron, or rather the iron in an armed Magnet. For its Nature is such that an armed Magnet, at some distance, does not attract iron more powerfully than an unarmed one. But if the iron be brought near enough to touch the iron in the armed Magnet, then the armed Magnet sustains a far greater weight of iron than a simple and unarmed one, on account of the

similarity of the substance of iron against iron ; an operation altogether *Clandestine* and latent in the iron before the approach of the Magnet. And so it is manifest that the Form of Coition is something which is energetic and powerful in the magnet, but weak and latent in iron. So it is remarked that small wooden arrows, without any iron point, when discharged from large mortars, penetrate deeper into timber (such as the sides of ships, and the like) than the same arrows pointed with iron, on account of the similarity of the substance of wood to wood, although this property was previously latent in the wood. Again, although air does not manifestly attract air, nor water water, in whole masses ; yet one bubble brought near to another dissolves it more readily than if the second bubble were away, on account of the desire of *Coition* between water and water, and between air and air. And *Clandestine Instances* of this kind (which, as we have said, are of the most signal use) make themselves most conspicuous in small and subtle portions of bodies, because the greater masses follow more universal and general Forms, as shall be declared in the proper place.

xxvi. Among *Prerogative Instances* we shall put in the fifth place, *Constitutive Instances*, which we also call *Manipular*. They are those which constitute one species of the Nature investigated into a sort of lesser Form. For since the legitimate Forms (which are always convertible with the Nature investigated) lie deep, and are not easily discovered ; circumstances and the weakness of the human Understanding require that particular Forms, which gather *Handfuls* of certain (but not all) Instances into some common notion, be not neglected, but rather diligently marked. For whatever unites Nature, though in an imperfect manner, levels the way for the discovery of Forms. And so Instances which are useful in this respect possess no contemptible influence, but have some Prerogative.

But in this case caution must be used, lest the human Understanding, after having discovered several of these particular Forms, and thereupon partitioned out or divided the Nature under investigation, should rest entirely contented therewith, in place of addressing itself to the legitimate discovery of the great Form ; and taking for granted that the Nature is from its roots manifold and divided, reject with contempt any further union of Nature as a thing unnecessarily subtle, and verging towards mere abstraction.

For example : let the Nature inquired into be Memory, or that which excites and aids it. *Constitutive Instances* are (1) Order or Distribution, which manifestly assists the memory ; also common-places in artificial memory, which may either be *Places* in the proper sense of the word, as a door, a corner, a window, and the like ; or familiar and well-known persons ; or anything we choose (provided they are arranged in a certain order), as animals, herbs ; also words, letters, characters, historical personages, &c., though some of these are more suitable and convenient than others. Common-places of this kind aid the memory wonderfully, and exalt it far above its natural powers. Also, verse is retained and learned by heart more easily than

prose. And from this *Handful* of three Instances, viz. order, common-places for artificial memory, and verse, is constituted one species of aid to the memory. Now this species may rightly be called the *Cutting away of the Indefinite*. For when we strive to remember or to call anything to mind, if we have no previous notion or perception of what we are seeking, we are sure to seek and labour, and run to and fro indefinitely. But if we have any certain previous notion, the Indefinite is immediately cut off, and memory wanders nearer home. Now, in the three Instances aforesaid, the previous notion is clear and certain. In the first it must be something agreeing with the order; in the second, an image bearing some relation or conformity to those fixed common-places: in the third, words which fall into the verse. And so the Indefinite is cut off. (2) Other Instances will give this second species; that whatever brings the Understanding close to something which strikes the senses (which is the method most approved of in artificial memory) helps the memory. (3) Other Instances will give this third species; that those which make an impression by a strong emotion, as by causing fear, wonder, shame, delight, help the memory. (4) Other Instances will give this fourth species; that those things which are chiefly impressed on the mind when it is clear, and not occupied by anything before or behind it, as what is learned in childhood, or what we fancy before sleep, and also things happening for the first time, are best retained in the memory. (5) Other Instances will give this fifth species; that a multitude of circumstances to be grasped as handles help the memory, as writing in disjointed paragraphs, reading or reciting aloud. (6) Lastly, other Instances will give this sixth species; that things which are expected, and excite attention, are retained better than those which fly past us. Thus if you read a writing through twenty times, you will not learn it by heart as easily as if you were to read it ten times, trying between whiles to recite it, and when memory fails, looking in the book. So that there are, as it were, six lesser Forms of things which help the memory, viz. the cutting off the Indefinite; the bringing down of the intellectual to the sensible; impression on a strong emotion; impression on a disengaged mind; a multitude of handles; and anticipation.

To take another example: let the Nature investigated be Taste, or the act of Tasting. The Instances which follow are *Constitutive*, viz. that those who cannot smell, but are destitute of that sense naturally, do not perceive, or distinguish by the taste, food that is rancid or putrid; nor, in like manner, what is flavoured with garlic, oil of roses, or the like. Again, those who by accident have their nostrils obstructed by a descent of rheum, do not discern or perceive anything putrid or rancid, or sprinkled with rose-water. Again, those who are affected with rheum of this sort, if they blow their noses strongly when they have anything fœtid or strongly scented in their mouth, or on their palate, instantly have a clear perception of the rancidity or perfume. Now these Instances will give and constitute this species, or rather part of Taste: that the sense of tasting is nothing but an internal smelling, passing and descending from the upper passages of

the nostrils into the mouth and palate. On the other hand, those in whom the sense of smell is wanting, or is obstructed, perceive as well as any one else what is salt, sweet, sharp, acid, rough, bitter, and the like ; so that it is manifest that the sense of Taste is somehow compounded of an internal smell, and a certain exquisite power of touch, of which this is not now the place to speak.

To take another example : let the Nature investigated be the communication of Quality, without commixture of substance. The *Instance* of Light will give or constitute one species of communication ; Heat and the Magnet another. For the communication of light is, as it were, momentary, and ceases directly the original light is removed. But heat and magnetic influence, when they have been once transmitted to, or rather excited in, a body, abide and remain for a considerable time after the departure of the original moving power.

In short, the Prerogative of *Constitutive Instances* is very great ; for they contribute very much both to definitions (especially particular definitions) and to the division or partition of Natures, about which it was not ill said by Plato : " That he is to be held as a God, who knows well how to define and divide."

xxvii. Among Prerogative Instances, we shall put in the sixth place, *Conformable* or *Proportionate Instances*, which we also call *Parallels*, or *Physical Resemblances*. They are those which show likenesses and conjunctions of things, not in lesser Forms (which is the work of *Constitutive Instances*), but simply in the concrete. Whence they form, as it were, the first and lowest steps towards the union of Nature. Nor do they establish any Axioms immediately from the beginning, but merely point out and mark a certain agreement of bodies. But although they are not of much assistance for the discovery of Forms, nevertheless they are very useful in revealing the fabric of the parts of the Universe, and in making a sort of anatomy of its members ; whence they sometimes lead us by the hand to sublime and noble Axioms ; especially those which have relation to the configuration of the world, rather than to simple Natures and Forms.

For example ; the following are *Conformable Instances* : a mirror and an eye ; likewise the construction of the ear, and places which give back an echo. From this conformity, besides the actual observation of likeness, which is useful for many purposes, it is easy further to gather and form this Axiom, viz. that the organs of the senses, and those bodies which generate reflections to the senses, are of like Nature. Again, the Understanding, admonished by this, rises without difficulty to a higher and nobler Axiom, viz. to this, that there is no difference between the agreement or sympathies of bodies endowed with sense, and those of inanimate bodies without sense, except that in the former animal spirit is added to a body duly disposed for it, while in the latter it is absent. So that there might be as many senses in animals as there are sympathies in inanimate bodies, if there were perforations in the animated body to allow the passage of the animal spirit into a member rightly disposed for it, as into a fit organ. And again, there may, doubtless, be as many motions in an inanimate

body, where the animal spirit is absent, as there are senses in animated bodies ; although there must of necessity be many more motions in inanimate bodies than there are senses in animate, on account of the paucity of organs of sense. And a very clear example of this appears in the case of pain ; for while there are many kinds of pain, and various characteristics of it, in animals, (as there is one pain of burning, another of intense cold, another of pricking, another of compression, another of extension, and the like,) still it is most certain that all these are present, as far as motion is concerned, in inanimate bodies ; as in wood or stone when burned, or congealed by frost, punctured, cut, bent, or beaten ; and so of other substances ; though sensation is not present, on account of the absence of animal spirit.

Again, *Conformable Instances* (surprising as it may seem to say so) are roots and branches of plants. For all vegetable substance swells, and throws out its parts in all directions, upwards as well as downwards. Nor is there any other difference between roots and branches than that the root is buried in the earth, and the branches are exposed to the air and sun. For if we take a tender and growing branch of a tree, and bend it down into a lump of earth, it forthwith produces not a branch, but a root. And, *vice versâ*, if earth be placed over it, and be so kept down with a stone, or any hard substance, as to restrain the plant from sprouting upwards, it will send forth branches into the air downwards.

Again, the gum of trees and many kinds of rock gems are *Conformable Instances*. For they are neither of them anything but exudations and filterings of juices ; in the first case from trees, in the second from rocks ; whence arises that clearness and brilliancy in each, that is, by the fine and accurate filtering. Thence it arises also that the hairs of animals are not so beautiful and of so vivid a colour as the feathers of very many birds ; because juices do not filter so delicately through skin as through quills.

Again, the scrotum in male animals and the matrix in females are *Conformable Instances* ; so that that structural difference between the sexes, which seems so remarkable (as far as land animals are concerned), seems to be no more than a difference between what is internal and external ; that is to say, the greater force of heat in the male sex protrudes the genitals outwards ; whereas, in the female, the heat is too weak to be able to effect this, whence it happens that they are contained internally.

Again, the fins of fish and the feet of quadrupeds are *Conformable Instances*, as are also the feet and wings of birds ; to which Aristotle has added the four coils in the motion of serpents ; so that in the machinery of the Universe the motion of living beings seems, for the most part, to be effected by sets of four joints or flexions.

Also the teeth of land animals and the beaks of birds are *Conformable Instances* ; whence it is clear that in all perfect animals there is a tendency of a certain hard substance towards the mouth. Also that is not an absurd likeness and conformity which is remarked to exist

between man and an inverted plant. For the head is the root of the nerves and faculties of animals ; while the seed-bearing parts are lowest, not taking into account the extremities of the legs and arms. But in a plant, the root (which answers to the head) is regularly placed in the lowest position ; and the seeds in the highest.

Lastly ; we must especially impress this precept : indeed we cannot too frequently remind men that their diligence in investigating and collecting Natural History must henceforth be entirely changed and turned into the opposite direction to that which it takes at present. For hitherto the industry of men has been great, and they have been very curious in marking the variety of things and in explaining the exact differences of animals, herbs, and fossils ; most of which are rather sports of Nature than of any serious use towards the Sciences. Things of this kind certainly tend to our gratification, and sometimes even to practical results, but they do little or nothing towards gaining an insight into Nature. And so our efforts must be entirely directed towards investigating and observing the resemblances and analogies of things, both in their entirety and in their parts ; for these are the things which unite Nature and commence the constitution of the Sciences.

But, in cases very weighty and urgent, caution must be added, that those things only be taken for *Conformable* and *Proportionate Instances* which denote (as we have said at the beginning) *physical* resemblances ; those, that is, which are real and substantial, lying deep in Nature, not such as are accidental and apparent, much less such as are superstitious or curious, which the writers on Natural Magic (arrant triflers, scarcely fit to be named in such serious matters as those which we are now handling) are everywhere parading ; describing, with great vanity and folly, empty similitudes and sympathies of things, and sometimes even inventing them.

But, leaving these, in the very configuration of the world itself, in its greater parts, there are *Conformable Instances* which must not be neglected ; as Africa, and the region of Peru, with the continent stretching as far as the Straits of Magellan. For each region has similar isthmuses and similar promontories, a coincidence which is not accidental.

Also the New and the Old World are *Conformable* ; in that both Worlds are broad and extended towards the North, but narrow and pointed towards the South.

Again, we find most conspicuous *Conformable Instances* in the intense colds of what is called the mid region of the air, and the very fierce fires which are often found bursting out of subterranean places ; two occurrences which are most widely and extremely removed ; that is to say, the extreme of the Nature of Cold towards the expanse of the sky, and the extreme of the Nature of Heat towards the bowels of the earth ; by *Antiperistasis*, or Rejection of a contrary Nature.

And lastly, the *Conformity of Instances* in the Axioms of the Sciences is worthy of remark ; thus the figure in rhetoric called

"Surprise" is *Conformable* to the figure in music called "Declension of the Cadence." In like manner the Mathematical Postulate, "Things which are equal to the same are equal to one another," is *Conformable* to the construction of the syllogism in Logic which unites properties agreeing in a middle term. In fine, a certain sagacity in investigating and tracking Physical Conformities and Resemblances is of great use in very many cases.

xxviii. Among *Prerogative Instances* we shall put in the seventh place, *Singular Instances*, which we also call *Heteroclite* (borrowing the term from the grammarians). These are those which exhibit in the concrete ; bodies which seem to be extravagant and, as it were, abrupt in Nature, and noways agreeing with other things of the same kind. *Conformable Instances* are like each other ; *Singular Instances* are like themselves alone. Now the use of *Singular instances* is the same as that of *Clandestine Instances*, viz. to raise and unite Nature for the discovery of Genera or Common Natures, which are afterwards to be limited by true Differences. For we must not desist from inquiry until the properties and qualities found in such things as these, and which may be taken for miracles of Nature, are reduced and comprehended under some fixed Form or Law ; so that all irregularity or singularity be found to depend on some common Form ; and the miracle at last turn out to consist only in accurate differences ; in degree, and in an unusual concurrence, not in the species itself : whereas, at present, the contemplation of man does not go further than to set down such things as secrets and great works of Nature : things, as it were, without cause, and exceptions to general rules.

Examples of *Singular Instances* are the sun and moon among heavenly bodies ; the magnet among stones ; quicksilver among minerals ; the elephant among quadrupeds ; the *sensus Veneris* among the kinds of touch ; the scent of dogs among the kinds of smell. Moreover, the letter S is held by grammarians to be singular, on account of the facility with which it enters into composition with consonants, sometimes two and sometimes three at a time ; which is the case with no other letter. Now, *Instances* of this sort should be made much of, because they sharpen and quicken inquiry, and heal the Intellect when it has become depraved by habit and the customary course of things.

xxix. Among *Prerogative Instances* we shall put in the eighth place, *Deviating Instances* ; errors, that is, of Nature, things which are vague and monstrous, wherein Nature declines and deflects from her ordinary course. For errors of Nature differ from *Singular Instances* in the fact that the latter are miracles of species, the former of individuals. But their use is nearly the same, for they correct errors arising in the Understanding from Habit, and reveal common Forms. Nor must we desist from inquiry with regard to them, until the cause of this declension is discovered. But that cause does not properly reach to any Form, but only to the *Latent Process* towards Form. For he who knows the ways of Nature will more easily observe her deviations

also ; and again, he who knows her deviations will more accurately describe her ways.

And they differ from *Singular Instances* in this also, that they furnish much more assistance for practice and active operation. For to generate new species would be a very difficult task ; but to vary known species, and thence to produce many things that are rare and unusual, is less difficult. It is easy to pass from miracles of Nature to miracles of Art. For if Nature be once caught in the act of variation, and the cause of it be made clear ; it will be easy to bring Nature by means of Art to the point whither she wandered by accident. And not only thither, but elsewhere ; for errors in one direction show and open out a way to errors and defections in every direction. But here the abundance of examples renders it unnecessary to produce them. For there must be made a collection or particular Natural History of all prodigies and monstrous births of Nature ; of everything, in short, that is new, rare, and unusual in Nature. But this must be accompanied by a most rigid scrutiny, that confidence may be established. And those are most to be suspected which are connected in any way with Religion, as the prodigies of Livy ; and no less those which are found in writers on Natural Magic or Alchemy, and men of that kind, who are, as it were, suitors and lovers of fables. But these must be drawn from grave and trustworthy history, and from true reports.

xxx. Among *Prerogative Instances* we shall put in the ninth place, *Limiting Instances*, which we also call *Participles*. They are those which exhibit species of bodies that seem to be compounded of two species, or to be rudimentary between one species and another. Now these may rightly be counted among *Singular Instances* or *Heterolites*, for they are in the whole range of things rare and extraordinary ; yet, on account of their dignity, they must be treated and ranked separately. For they are most useful in indicating the composition and structure of things, and in suggesting causes for the number and quality of the ordinary species in the Universe, and in leading the Understanding from that which is to that which may be.

As examples of these, we have moss, between putridity and a plant ; some comets, between stars and fiery meteors ; flying fish, between birds and fishes ; bats, between birds and quadrupeds ; also,

"*Simia quam similes, tu pissima bestia, nolis.*"

("Basest of beasts, the ape, how aping us !")

Biformed births of animals, mules, and the like.

xxxi. Among *Prerogative Instances* we shall put in the tenth place, *Instances of Power*, or of the *Fases* (borrowing the word from the insignia of empire), which we also call *the Wit or the Hand of Man*. They are the greatest and noblest works, and, as it were, the master-pieces of each several art. For since it is our principle business to make Nature render homage to the affairs and convenience of man, it is very suitable that the works which are already in man's power (like provinces previously occupied and subdued) should be noted and registered ; especially those which are most complete and perfect,

because from them the passage to what is new and hitherto undiscovered is easier and nearer. For if a man, after attentively contemplating these, be willing actively and strenuously to push on his design; he will, of a certainty, either extend them a little further; or turn them aside to something in their neighbourhood; or even apply and transfer them to some more noble use.

Nor is this the end. For even as the Understanding is raised and elevated by rare and unusual works of Nature to the investigation and discovery of Forms capable of containing them, so also this is brought about by the excellent and admirable works of Art. Nay, this is so in a much greater degree, for the method of affecting and bringing about such miracles of Art is, for the most part, clear; while in the miracles of Nature the process is generally obscure. Still very great caution must be used in these same cases not to depress the Understanding, and, in a manner, fasten it to the ground.

For there is a danger lest works of Art of this kind, which seem to be the summits and culminating points of human industry, should so surprise and fetter, and, as it were, bewitch the Understanding respecting them, that it should not be able to deal with other things, but should think that nothing of that kind can be done, except in the same way in which they have been brought about; only with the application of greater diligence and more accurate preparation.

On the contrary, it may be laid down as certain that the ways and means of effecting results, hitherto discovered and noted, are, for the most part, poor, and that all higher power depends on and is derived in order from the sources of Forms, no one of which has as yet been discovered.

And so (as we have said elsewhere) if a man had been thinking of machines and battering rams as they existed among the ancients; even if he had done so with diligence, and spent his life in the study, he would never have lighted on the discovery of cannon, acting by means of gunpowder. Nor again, if he had concentrated his observation and meditation on the manufactures of wool and cotton, would he ever by such means have discovered the nature of the silkworm or of silk.

Therefore it is that all discoveries which can be reckoned among the noblest of their kind, have, if you look closely, been brought to light, not by a trifling elaboration and extension of Arts, but entirely by chance. Now nothing imitates or anticipates chance (the custom of which is to act only at long intervals) but the discovery of Forms.

There is no need to adduce particulars of this kind of Instances, they are so plentiful; for the course to be followed is exactly this: to visit all mechanical and even liberal Arts (as far as they bear upon results), and to look closely into them; and then to make a collection or particular history of great works and masterpieces, and of those which are most perfect in each, together with the modes of carrying them into effect or operation.

And yet we do not tie down the diligence which should be used in such a collection to those works only which are regarded as the master-

pieces and mysteries of each Art, and which create wonder. For wonder is the offspring of rarity ; since what is rare, though in kind it be common enough, begets wonder.

While, on the contrary, things really deserving admiration, on account of the difference which exists between them and other species, yet, if they happen to be in familiar use, are observed but carelessly. Now, the *Singular Instances* of Art ought to be observed no less than those of Nature, of which we have before spoken. And just as we place the sun, the moon, the magnet, and the like (things of most common occurrence, yet of a Nature almost singular), among the *Singular Instances* of Nature ; the same should be done with the *Singular Instances* of Art.

E.g., Paper, although a very common thing, is a *Singular Instance* of Art. But if you consider it carefully, you will find that artificial materials are either entirely woven with woof and warp ; such as silk, wool, flax, linen, and the like ; or else they are congealed from concrete juices ; as brick, earthenware, glass, enamel, porcelain, and the like ; which, if well combined, are bright ; if not, they are hard, indeed, but not bright. But all such things as are made from concrete juices are brittle, and nowise coherent or tenacious. On the contrary, paper is a tenacious substance, which may be cut and torn ; so that it imitates, and almost rivals the skin or membrane of an animal, or the leaf of a vegetable, and such like productions of Nature. For it is neither brittle like glass, nor woven like cloth, but fibrous and without any distinct threads, just like natural materials ; so that among artificial materials there can scarcely be found anything similar, but it is quite *singular*. And certainly among artificial works those are to be preferred which approach most nearly to the imitation of Nature, or, on the contrary, effectually control and change her direction.

Again, among *Instances of the Wit and Hand of Man*, we must not utterly despise sleight of hand and juggling tricks. For some of these, though in practice they be trifling and laughable, may yet be valuable in suggesting information.

Lastly, matters of superstition and magic (in the common acceptation of the word) must not be altogether omitted. For though things of this kind are buried under an enormous heap of falsehood and fable ; still we must look into them a little, in case there should be hidden below some of them some natural operation ; as in fascination, the strengthening of the imagination, the sympathy of things at a distance, the transmission of impressions from spirit to spirit, no less than from body to body, and the like.

xxxii. From what has been already said, it is clear that these five kinds of *Instances* of which we have spoken (viz. the *Conformable*, *Singular*, *Deviating*, and *Limiting Instances*, and the *Instances of Power*) ought not to be reserved until some certain Nature be under inquiry (as should be the case with those other *Instances* which we set forth first, and also with many of those to follow) ; but a collection of them should be at once commenced, as a sort of particular Natural

History ; because they serve to digest the matters that enter the Understanding and to correct the depraved complexion of the Understanding itself, which must of necessity be imbued, infected, and at length perverted and distorted, by daily and habitual impressions.

Therefore these Instances are to be applied as a preparative, to correct and purge the Understanding. For whatever withdraws the Understanding from its accustomed pursuits, smooths and levels its surface for the reception of the dry and pure light of true notions.

Moreover, Instances of this kind level and prepare the way for the Operative part : as we shall show in the proper place, when we come to discourse of *Deduction to Practice*.

xxxiii. Among *Prerogative Instances* we shall put in the eleventh place, *Accompanying and Hostile Instances*, which we also usually call *Instances of Fixed Propositions*. They are those Instances which exhibit some body, or such like concrete, in which the Nature under inquiry always follows as an inseparable companion ; or which, on the other hand, it constantly avoids, and by which it is excluded from *companionship*, as a foe and an enemy. For it is out of *Instances* of this kind that Fixed and Universal Propositions are formed, either *Affirmative* or *Negative* ; in which the subject will be such a body in the concrete, and the predicate the Nature under inquiry. For Particular Propositions are in no way *fixed* ; namely, those in which the Nature under inquiry is found fluctuating and moveable in some concrete ; that is to say, as accruing or acquired, or, on the other hand, receding or laid aside. Wherefore Particular Propositions have none of the higher *Prerogatives*, except in the case of *Migration*, of which we have already spoken. Nevertheless, even these Particular Propositions, when compared and collated with Universal Propositions, are of great use, as will be shown in the proper place. Nor even in these Universal Propositions do we require an exact or absolute affirmation or negation ; for it is sufficient for our purpose, even if they be subject to some singular or rare exception.

Now, the use of *Accompanying Instances* is to narrow the *Affirmative* of the Form. For as in *Migrating Instances* the *Affirmative* of the Form is narrowed in such wise that the Form of the thing must necessarily be laid down as something which is assumed or destroyed by the act of *Migration*, so also, in *Accompanying Instances*, the *Affirmative* of the Form is narrowed in such a way that the Form of the thing must necessarily be laid down as something which enters into such a concretion of body, or, on the other hand, is repugnant to it ; so that he who is well acquainted with the constitution or structure of such a body, will not be far from bringing to light the Form of the Nature under inquiry.

For example, let the Nature inquired into be Heat : an *Accompanying Instance* is Flame. For in water, air, stone, metals, and many other substances, heat is mobile, and can approach and recede ; but all flame is hot, so that heat always follows on the concretion of flame. But no *Hostile Instance* of heat is found among us. For nothing connected with the bowels of the earth is patent to our

senses, while of those bodies which we do know there is not a single concretion which is not susceptible of heat.

Again, let the Nature inquired into be Consistency. A *Hostile Instance* is Air. For metal may be fluid, and also possess consistency ; the same is the case with glass ; water also can possess consistency when it is frozen ; but it is impossible that air can ever possess consistency, or put off its fluidity.

But with regard to such *Instances of Fixed Propositions* there remain two warnings which are of use for the matter in hand. The first is, that if a *Universal Affirmative* or *Negative* be wanting, that very thing should be diligently marked as non-existent ; as we have done concerning heat, where the *Universal Negative* (as far as regards the essences which have come to our knowledge) is wanting in the Nature of things. Similarly, if the Nature inquired into be Eternity or Incorruptibility, we have here no *Universal Affirmative*. For eternity or incorruptibility cannot be predicated of any of those bodies which are beneath the heavens, and above the interior of the earth. The other warning is, that to Universal Propositions, Affirmative or Negative, concerning any concrete, there should be subjoined at the same time those concretes which seem to approach most nearly to that which is non-existent ; as in heat, the most gentle and least scorching flames ; in incorruptibility, gold, which comes nearest it. For all such indicate the limits of Nature between the existent and the non-existent ; and help to circumscribe Forms, by hindering them from spreading and wandering beyond the conditions of matter.

xxxiv. Among *Prerogative Instances* we shall put in the twelfth place, those same *Subjunctive Instances* concerning which we spoke in the foregoing Aphorism, which we also call *Ultimate* or *Limiting Instances*. For Instances of this kind are not only useful when subjoined to fixed propositions, but also by themselves, and in their own proper Nature ; for they indicate, not obscurely, the true divisions of Nature and measures of things, and how far Nature may do and endure in any case ; and then her passage to something else. Such are, gold in weight, iron in hardness, the whale in size among animals, the dog in scent, the inflammation of gunpowder in rapid expansion, and other things of that kind. Nor should those things which are extreme in the lowest degree be less noticed than those which are extreme in the highest ; as spirit of wine in weight, silk in softness, the worms of the skin in size of animal, &c.

xxxv. Among *Prerogative Instances* we shall place in the thirteenth place, *Instances of Alliance* or *Union*. They are those which mingle and unite Natures which are thought to be heterogeneous, and as such are marked and designated by the received divisions.

Now, *Instances of Alliance* show that the operations and effects which are set down as peculiar to some one of those heterogeneous Natures belong also to others ; so that what is supposed to be heterogeneous is proved to be such neither really nor essentially, but only a common Nature modified. And so they are of excellent use in elevating and raising the Understanding from differences to genera,

and in removing spectres and false images of things as they occur and come forth under the disguise of concrete substances.

For example, let the Nature inquired into be Heat. There seems to be a distribution, apparently quite customary and authentic, which constitutes Heat into three genera; viz., heat of heavenly bodies, heat of animals, and heat of fire; and which makes these kinds of heat (especially one of them, compared with the other two) in very essence and species, (or specific Nature,) distinct and altogether heterogeneous; since both the heat of celestial bodies and that of animals generate and cherish, while the heat of fire, on the contrary, corrupts and destroys. Thus, as an *Instance of Alliance*, we have the very common experiment of introducing a vine-branch into a room where there is a constant fire, when the grapes upon it ripen a full month sooner than they do out of doors; so that the ripening of fruit, even when it hangs on the tree, may be brought about by fire, though this seems to be the peculiar work of the sun. From this beginning, therefore, the Understanding easily rises, having got rid of the notion of essential heterogeneity, to the inquiry, what are the differences really found to exist between the heat of the sun and of fire, from which it results that their operations are so dissimilar, although they themselves share in a common Nature.

These differences will be found to be four in number: viz., firstly, that the heat of the sun, compared with the heat of fire, is far milder and more gentle in degree; secondly, that it is (especially as we receive it through the air) much moister in quality; thirdly (which is the principal point), that it is exceedingly unequal, now approaching and increased, now receding and diminished; a circumstance which contributes very greatly to the generation of bodies. For Aristotle was right in asserting that the principal cause of the generation and corruption which takes place here on the surface of the earth is the obliquity of the sun's course through the zodiac; whence the heat of the sun, partly by the vicissitudes of day and night, partly by the succession of summer and winter, becomes marvellously unequal. And yet that remarkable man goes on to corrupt and render worthless what he has rightly discovered. For, like a very judge of Nature, he (as is his custom), in a most magisterial manner, assigns, as the cause of generation, the approach of the sun; as the cause of corruption, his retreat; whereas both (the approach, that is to say, of the sun and his retreat), not respectively, but, as it were, indifferently, supply the cause for both generation and corruption; inasmuch as inequality of heat brings about the generation and corruption of things, equality their conservation only. And the fourth difference between the heat of the sun and of fire is of very great moment, viz., that the sun insinuates its action throughout long spaces of time; while the operations of fire (man's impatience urging them on) are accomplished in shorter periods. But if any one were to set to work diligently to attenuate the heat of fire, and to reduce it to a milder and more moderate degree (as may easily be done in many ways, and were then to sprinkle and intermingle a little moisture, and especially if he were

to imitate the heat of the sun in its inequality ; and lastly, if he would patiently endure delay (not, indeed, proportioned to the operation of the sun, but yet greater than that which men usually allow to the operations of fire), he would easily get rid of that notion of heterogeneous heat, and would either approach, or else equal, or in some cases even surpass, the operations of the sun with the heat of fire. A similar *Instance of Alliance* is found in the revival of butterflies, torpid and, as it were, dead with cold, by warming them a little at a fire ; so that you may easily see that fire possesses the power of vivifying animals, as well as that of ripening vegetables. So also that celebrated invention of Fracastorius, of a pan strongly heated, with which doctors cover the heads of apoplectic patients in desperate cases, manifestly expands the animal spirits, compressed and, as it were, extinguished by the humours and obstructions of the brain, and excites them to motion, in the same manner as fire acts upon water or air. Again, eggs are sometimes hatched by the heat of fire, which is an exact imitation of animal heat ; and there are many other things of that kind ; so that no one can doubt but that the heat of fire may in many subjects be modified so as to resemble that of heavenly bodies and of animals.

In like manner let the Natures inquired into be Motion and Rest. It seems to be a usual division, and one originating in the deepest philosophy, that natural bodies either revolve, or move in a straight line, or else stand still and at rest. For there is either motion without limit, or rest in a limit, or progress towards a limit. Now this perpetual motion of rotation seems peculiar to heavenly bodies ; station or rest seems to belong to the globe of the earth ; while other bodies (which they call heavy and light), being placed out of their natural position, are carried in a straight line toward masses or congregations of similar bodies, the light upwards towards the circumference of heaven, the heavy downwards towards the earth. But this is pleasing talk.

Again, one of the lower Comets is an *Instance of Alliance* ; in that, though far below the heaven, it yet revolves. And Aristotle's fiction, of a comet being tied to some star, or following close upon it, has long been exploded ; not only because it is improbable in reason, but on account of our manifest experience of the discursive and irregular motion of comets through the various regions of the heavens.

Again, another *Instance of Alliance* on this subject is the Motion of Air, which within the tropics (where the circles of revolution are larger) seems also itself to revolve from east to west.

And again, another *Instance* would be the Flow and Ebb of the Sea, provided that the waters themselves are found to be carried by motion of revolution (however flow and evanescent) from the east to the west ; so, however, that they be brought back twice a day. Therefore, if this be the case, it is manifest that that motion of revolution is not limited to heavenly bodies, but is shared by air and water.

Even the property which light bodies have of tending upwards is somewhat exceptionable. And in this case a Bubble of Water may

be taken as an *Instance of Alliance*. For if air be liberated under water, it ascends rapidly towards the surface of the water, by that motion of a stroke (as Democritus calls it) by which the water descending strikes and raises the air upwards; and not by any striving or effort of the air itself. And when it is come to the surface of the water, then the air is restrained from further ascent by the slight resistance which it meets with in the water's not immediately allowing itself to be separated, so that the desire of air to rise is very trifling.

In like manner let the Nature inquired into be Weight. It is clearly a received division, that dense and solid bodies move towards the centre of the earth; rare and subtle ones towards the circumference of the heavens, as to their proper places. And as regards places (although in the Schools such things are of weight), it is quite foolish and puerile to think that place has any power. So that many philosophers are trifling when they say, that, if the earth were perforated, heavy bodies would stop when they came to the centre. For it would be certainly a very mighty and efficacious sort of nothing, or mathematical point, which could either affect other things, or for which other things could feel a desire; for body is not acted upon but by body. But this desire of ascending and descending depends either upon the structure of the body moved, or on its sympathy and agreement with some other body. If any body be discovered which is dense and solid, and which, nevertheless, does not move towards the earth, this division is nullified. But if Gilbert's opinion be received, that the earth's magnetic power of attracting heavy bodies does not extend beyond the orb of its influence (which operates always to a certain distance and no further), and if this opinion be verified by any Instance, here will be at length an *Instance of Alliance* on this subject. There does not, however, occur at present any certain and manifest Instance on this point. Nearest it seem to come the waterspouts which are often met with in voyages across the Atlantic Ocean to either India. For so great is the visible force and mass of water suddenly discharged by cataracts of this kind, that it seems as if a collection of waters had been previously made, and had halted and remained in those places, and had afterwards been thrown down by some violent cause, rather than fallen by the natural motion of gravity; so that it may be conjectured that a dense and compact corporeal mass, at a great distance from the earth, would be pensile like the earth itself, and would not fall, unless thrown down. But of this we affirm nothing as certain. Meanwhile it will easily appear, from this and many other cases, how poor we are in Natural History, since, instead of certain *Instances*, we are not unfrequently compelled to bring forward suppositions as examples.

In like manner let the Nature inquired into be Discourse of Reason. The distinction between human reason and the sagacity of brutes seems altogether a true one. But yet there are some Instances of actions exhibited by brutes from which it seems that they also are able to syllogize after a fashion; for instance, we recollect to have

heard tell of a crow, which, being nearly dead with thirst during a great drought, saw some water in the hollow of a tree, and finding the opening too narrow for it to enter, threw in a number of pebbles, until the water rose high enough for it to drink, which afterwards passed into a proverb.

In like manner let the Nature inquired into be Visibility. It seems to be a perfectly true and safe distinction which is made between Light, as visible originally, and affording the primary means of seeing, and Colour, as being visible secondarily, and not to be discerned without light ; so that it appears to be nothing but an image or modification of Light. And yet, on either side in this case, there appear to be *Instances of Alliance* ; as snow in large quantities, and the flame of sulphur ; in one of which we see Colour primarily giving Light, in the other, Light verging towards Colour.

xxxvi. Among Prerogative Instances we shall put in the fourteenth place, *Instances of the Cross*, the word being borrowed from the *Crosses*, which are set up where roads meet, to indicate and mark the different directions. These we call also *Decisive* and *Judicial*, and, in some cases, *Oracular* and *Commanding Instances*. Their method is as follows. When, in the investigation of any Nature, the Understanding is placed, so to speak, *in equilibrio*, so that it is uncertain to which of two, or sometimes more Natures, the cause of the Nature investigated ought to be attributed or assigned, on account of the frequent and ordinary concurrence of several Natures ; *Instances of the Cross* show the union of one of the Natures with the Nature investigated to be sure and indissoluble, that of the other to be changeable and separable ; thus the question is decided, and the former Nature is received as the cause, while the latter is dismissed and rejected. And so Instances of this kind supply very great light, and are of great authority ; the course of Interpretation sometimes ending in them, and being accomplished by them. Sometimes these *Instances of the Cross* are discovered by chance among those already noticed ; but they are for the most part new, and industriously and designedly sought out and applied, and discovered only by unremitting and active diligence.

For example, let the Nature inquired into be the Flow and Ebb of the Sea, which is repeated twice in the day, and occupies six hours in each advance and retreat, with a certain difference corresponding with the motion of the moon ; the following is an example of two ways meeting with respect to this Nature.

This motion must necessarily be caused either by the advance and retreat of the waters, as water shaken in a basin wets one side and leaves the other bare ; or by the rising of the waters from the deep, and their subsidence, after the manner of water which boils and again subsides. And the question arises, to which of these three causes should the flow and ebb be assigned ? Now, if the first assertion be admitted, it must happen that when there is flood-tide in the sea on the one side, there is at the same time an ebb somewhere on the other ; to this issue, therefore, the inquiry is brought. But it has

been observed by Acosta and others, after diligent inquiry, that on the coast of Florida, and on the opposite coasts of Spain and Africa, the flood-tides take place at the same time, and the ebbs likewise take place at the same time ; not, contrariwise, that when there is a flood on the coast of Florida, there is an ebb on the coasts of Spain and Africa. And yet, if we look more carefully, this does not prove the existence of the elevating, nor disprove that of the progressive motion. For it may happen that the waters may move in progression, and yet cover opposite shores of the same channel at the same time ; if we suppose these waters to be thrust and driven together from another quarter, as is the case with rivers which flow and ebb on both banks at the same hours ; and yet that motion is clearly one of progression, the waters entering the mouths of the rivers from the sea : so, in like manner, it may happen that waters coming in a great mass from the Eastern or Indian Ocean are driven together, and thrust into the channel of the Atlantic Sea, and so flood both sides at one time. We have, therefore, to inquire whether there be another channel through which the waters can be retreating and ebbing at the same time ; and we find the Southern Sea, which certainly is not smaller, if indeed it be not wider and more extensive than the Atlantic itself, and this is sufficient for our purpose.

So we have, at length, arrived at an *Instance of the Cross* on this subject ; and it is this. If we find for certain that when there is a flood on the opposite shores of Florida and Spain in the Atlantic, there is also a flood on the shores of Peru, and behind China in the Southern Sea, then indeed this *Decisive Instance* compels us to reject the assertion that the flow and ebb of the sea, which is the thing inquired into, takes place by progressive motion ; for there is no sea nor place in which the regress or ebb can be going on at the same time. And this may be most conveniently determined by asking the inhabitants of Panama and Lima (where the two oceans, the Atlantic and the Southern, are separated by a small isthmus, whether the flow and ebb of the sea takes places on opposite sides of the Isthmus at the same time, or whether the reverse is the case. Now this decision or rejection appears to be certain, if we take for granted that the earth is immoveable ; but if the earth revolves, it may perhaps be the consequence of the unequal rotation (in point of speed and momentum) of the earth and of the waters of the sea, that the waters are violently driven upwards into a heap, which makes the flood ; and then (when they will endure no more heaping up) they are released in a downward direction, which makes the ebb. But on this head separate inquiry must be made. Still, even on this supposition, the fact is equally established that there must be an ebb of the sea going on in some places at the same time that there is a flood in others.

Similarly, let the Nature inquired into be the latter of the two motions suggested, viz., the Rising and Subsiding Motion ; if by chance it happens that (on diligent examination) we reject the former motion of which we have spoken, viz., the progressive. Then we shall have three ways meeting about this Nature, after this wise.

The motion by which waters rise in flood and sink in ebb, without any accession of external waters, must of necessity take place in one of these three ways : either there is a supply of water emanating from the interior of the earth, and retiring into it again ; or the mass of water is not augmented, but the same waters are extended (without receiving any addition to their quantity) ; or rarefied, so as to fill a larger space and dimension, and contract themselves again ; or there is no increase either of quantity or of extension, but the same waters (just as they are in quantity and density) are raised by sympathy with some magnetic force attracting them from above, and then fall back again. And so (the two former motions being dismissed) our consideration may now be reduced to this point, and we may ask if any such elevation by sympathy or magnetic force does take place. Now, in the first place, it is manifest that the whole of the water, as it is disposed in the trench or hollow of the sea, cannot be raised at the same time, there being nothing to supply its place at the bottom ; so that, even if there were in water any such desire of rising, it would be broken and checked by the connection of things, or (as it is commonly called) the abhorrence of a vacuum. It remains that the waters are raised on one side, and are thereby diminished and retreat on another. Again, it will follow of necessity that that magnetic force, since it cannot act upon the whole, will operate with the greatest intensity about the middle, so as to raise the water in that part ; and as that is raised, the sides are necessarily deserted and left bare in succession.

Thus we have at length arrived at an *Instance of the Cross* on this subject. And it is this. If it be found that during the ebb of the sea the surface of the waters is more arched and round, owing to the rising of the waters in the middle of the sea and their falling away at the sides, I mean the shores ; and that during the flood the same surface is more level and even, owing to the return of the waters to their former position ; then indeed, on the strength of this *Decisive Instance*, the raising by magnetic force may be received ; otherwise it must be entirely rejected. Now, trial of this might without difficulty be made in the narrow seas by means of sounding lines ; that is to say, whether during ebb the sea be not higher or deeper towards the middle than during floods. It must, however, be noted that, if this be the case, the waters must (contrary to the common belief) rise during the ebb and sink during the flood, so as to cover and wash the shores.

In like manner let the Nature inquired into be the Spontaneous Motion of Rotation, and especially whether the diurnal motion, by which the sun and stars rise and set to our view, be a real motion of revolution in the heavenly bodies, or an apparent motion in the heavenly bodies and a real one in the earth. We shall find, on this subject, the following *Instance of the Cross*. If there be found any motion in the ocean from east to west, however weak and languid ; if the same motion be found a little brisker in the air, especially within the tropics, where it is more perceptible, on account of the greater circles ; if the same motion be found in the lower comets, but now

grown lively and strong ; if the same motion be found in the planets, but so disposed and graduated that the nearer the planet is to the earth the slower is the motion, the farther the planet is distant the quicker is the motion, and in the starry heavens quickest of all ;— then, indeed, the diurnal motion must be received as real in the heavens, and the motion of the earth rejected ; since it will be manifest that motion from east to west is entirely cosmical, and by consent of the universe ; being most rapid in the highest parts of the heavens, gradually subsiding, and at last ceasing and being extinguished in the immovable, that is, the earth.

In like manner let the Nature inquired into be that other Motion of Rotation so celebrated among astronomers, resisting and opposed to the diurnal motion, viz., from west to east ; which the old astronomers attribute to the planets and also to the starry heavens, but Copernicus and his followers to the earth as well ; and let it be asked whether any such motion be found in Nature, or whether it be not rather a theory fabricated and assumed for the convenience and abbreviation of calculation, and to favour that beautiful project of explaining the motion of the heavenly bodies by means of perfect circles. For this motion in the higher regions is in no way proved to be true and real, either by the failure of a planet to return, in its diurnal motion, to the same point in the starry sphere, or by the different polarity of the zodiac as compared with that of the world ; which two things have originated the idea of this motion. For the first phenomenon is admirably accounted for by supposing that one is passed by and out-run by another : the second by the supposition of spiral lines ; so that the inequality of return and the declination to the tropics may rather be modifications of the one diurnal motion than motions of resistance, or about different poles. And most certain it is, if we may reason like plain men for awhile (dismissing the fictions of astronomers and the schools, whose fashion it is unreasonably to do violence to the senses, and to prefer what is most obscure), that this motion does appear to the sense such as we have described it ; and we once caused it to be represented by a sort of machine composed of iron wires.

The following may be taken as an *Instance of the Cross* on the subject. If there be found in any history worthy of credit that there has been any comet, of either the higher or lower class, which has not revolved in manifest correspondence (however irregular) with the diurnal motion, but has rather revolved towards the contrary part of the heavens, then indeed we must determine thus much, that there is in Nature some such motion. But if nothing of this kind is found, it must be regarded as suspicious, and recourse must be had to other *Instances of the Cross* on this point.

In like manner let the Nature investigated be Weight or Gravity. We have two roads meeting about this Nature, after this fashion. Heavy and weighty bodies must needs either tend of their own Nature towards the centre of the earth, by reason of their peculiar structure, or else they must be attracted by the corporeal mass of the earth itself, as by a congregation of kindred bodies, and move towards it by

sympathy. Now, if the latter of these two causes be the right one, it follows that the nearer heavy bodies approach the earth, the stronger and more impetuous is their motion towards it ; and the farther they are from it, the weaker and slower is that motion (as is the case with magnetic attraction), and that this takes place within certain limits ; so that if they were removed to such a distance from the earth that the earth's influence could not act upon them, they would remain suspended, like the earth itself, and would not fall at all.

And so we may employ the following *Instance of the Cross* in this case. Take a clock worked by means of leaden weights, and another worked by compression of an iron spring ; adjust them accurately, so that one may not go faster or slower than the other ; then place the clock which is moved by the weights upon the tower of a very high church, and keep the other on the ground ; note carefully whether the clock placed on the elevation goes more slowly than usual, owing to the diminished virtue of the weights. Try the same experiment at the bottom of deep mines, viz., whether a clock of the kind mentioned does not go faster than usual, on account of the increased value of the weights. And if the value of the weights is found to be diminished in the higher and increased in the lower position, we may receive the attraction of the mass of the earth as the cause of weight.

In like manner let the Nature investigated be the Polarity of the Iron Needle, when touched with the Magnet. With regard to this Nature we shall have two roads meeting after this fashion. The touch of the magnet must either of itself impart a north and south polarity to the iron, or it must only excite the iron and prepare it, while the motion itself is communicated by the presence of the earth ; as Gilbert thinks and takes so much pains to prove. To this conclusion, therefore, tend the observations which he has collected with such clear-sighted industry ; to wit, that an iron nail, which has lain for some time in a direction north and south, after a lapse of some time gathers polarity without the touch of the magnet ; as if the earth itself, which on account of the distance operates feebly (the surface or outer crust of the earth being, as he says, destitute of magnetic virtue), were yet enabled by this long continuance to supply the place of the magnet, and excite the iron, and then conform and turn it. Again, if iron be heated to whiteness, and be laid, while cooling, north and south, it also acquires polarity without the touch of the magnet ; as if the particles of the iron, set in motion by the ignition, and afterwards recovering themselves, were at the very moment of extinction more susceptible, and, so to speak, sensitive of the influence proceeding from the earth than at other times, and thence became excited. But these things, although well observed, yet do not prove quite so much as he asserts.

Now, as an *Instance of the Cross* on this subject we may take the following. Take a magnetized globe and mark its poles, and let the poles of the magnet be arranged east and west, instead of north and south, and so remain ; then place above it an untouched iron needle, and let it remain six or seven days. Now the needle (for there is no

doubt about this), while it remains above the magnet, will leave the poles of the world, and turn itself towards the poles of the magnet. Therefore, as long as it remains there it will point east and west. But if it be found that the needle, when removed from the magnet and placed on a pivot, immediately places itself north and south, or even takes that direction by degrees, then the presence of the earth must be taken as the cause ; but if it points (as before) east and west, or loses its polarity, this cause must be regarded as suspicious, and further inquiry must be made.

In like manner let the Nature inquired into be the Corporeal Substance of the Moon, whether it be rare, consisting of flame or air, as very many of the old philosophers thought, or solid and dense, as Gilbert and many moderns, together with some of the ancients, hold. The reasons for this latter opinion are founded principally on the fact that the moon reflects the rays of the sun ; and there does not seem to be any reflection of light except from solid bodies.

Therefore the *Instances of the Cross* on this subject (if any there be) will be such as prove that reflection does take place from a rare body, such as flame, if it be of sufficient thickness. Certainly one cause of twilight, amongst others, is the reflection of the rays of the sun from the higher regions of the air. Also, we sometimes see the rays of the sun reflected, on fine evenings, from the fringes of dense clouds, with a splendour equal to, or rather brighter and more glorious than, that reflected from the body of the moon ; and yet there is no proof that these clouds have collected into a dense body of water. Also, we see the dark air behind windows reflect the light of a candle no less than a dense body would. We should also try the experiment of transmitting the rays of the sun through an opening upon any dusky blue flame. Indeed, the open rays of the sun falling on obscure flames appear, as it were, to deaden them, and make them seem more like white smoke than flame. These are what occur to us at present as *Instances of the Cross* with regard to this matter, and better may perhaps be found. But we must always observe that reflection from flame is not to be expected except from a flame of some depth, for otherwise it verges upon transparency. This, however, must be set down as certain, that light on an even body is always either taken up and transmitted, or else reflected.

In like manner let the Nature investigated be the Motion of Missiles, such as darts, arrows, shells, &c., through the air. This motion the School (after their usual fashion) explained in a very slovenly manner, thinking it enough to call it a violent motion, as distinguished from what they call natural motion ; and to account for the first percussion or impulse by stating that two bodies cannot occupy the same place, owing to the impenetrability of matter ; and caring nothing how the motion progresses subsequently. Now, about this Nature, two ways meet after this fashion. Either that motion is caused by the air carrying on the projected body and collecting behind it, as the stream acts upon a boat, or the wind upon straws ; or by the parts of the body itself not being able to sustain the impression, but advancing in suc-

cession to relieve themselves from it. The first of these explanations is received by Fracastorius, and nearly all who have inquired into motion with any subtlety ; and there is no doubt that the air has some share in the matter ; but the other motion is undoubtedly the true one, as is clear from countless experiments. Among others, we may take as an *Instance of the Cross* the following : that a thin plate, or rather stiff wire of iron, or even a reed or pen split in the middle, when pressed together and bent between the finger and thumb, leaps away. For it is clear that this cannot be ascribed to the air collecting behind the body, since the source of motion is in the middle of the plate or reed, and not in the ends.

In like manner let the Nature investigated be that rapid and potent Expansion of Gunpowder into Flame, by which such vast masses are upheaved, so great weights hurled forth, as we see in the case of mines and mortars. Two ways meet about this Nature after the following fashion. Either the motion is excited by the mere desire of the body to dilate when set on fire, or by the superadded desire of the crude spirit, which flees rapidly from the fire, and bursts violently from its embrace, as if from a prison. Now, the Schoolmen and common opinion only busy themselves with the former kind of desire. For men think that it is a fine piece of philosophy to assert that the flame is, by its elementary form, endowed with a certain necessity of occupying a greater space than the body filled when it was in the form of powder, and that thence arises that motion. Meanwhile, they do remark, that although this is true, if it be granted that flame is generated, it is still possible that the generation of flame may be impeded by a mass of matter sufficient to compress and suffocate it, so that the case is not reduced to the necessity of which they speak. For they say rightly that there must necessarily be expansion, and that thence must follow emission or removal of the resisting body, if flame be generated. But that necessity is entirely avoided if the solid mass suppress the flame before it be generated. And we see that flame, especially in its first generation, is soft and gentle, and requires a hollow space in which to play and make trial of itself. And so such violence cannot be attributed to flame by itself. But the truth is, that the generation of such windy flames or, so to speak, fiery winds, arises from the conflict of two bodies of entirely opposite natures,—the one very inflammable, which is the peculiar character of sulphur, the other dreading flame, as does the crude spirit which exists in nitre ; so that a marvellous conflict takes place, the sulphur taking fire as quickly as possible (for the third body, the willow charcoal, does scarcely anything but incorporate the other two, and combine them advantageously) ; while the spirit of the nitre bursts quickly forth, and at the same time expands (for it is the property of air and all crude bodies, and also of water, to expand by heat), and by this flight and eruption meanwhile fans the flame of the sulphur on all sides, as if with hidden bellows.

Now, there may be two *Instances of the Cross* on this subject. **The** one, of those bodies which are most inflammable, such as sulphur,

camphor, naptha, and the like, with their compounds, which catch fire more quickly and easily than gunpowder, if they be not hardened ; whence it appears that the desire of catching fire does not bring about those tremendous effects : the other Instance is that of those which avoid and dread flame, as all salts. For we see that if they be cast into the fire the watery spirit bursts forth with a crackling report before flame is kindled, which is also the case, in a less degree, with stiff leaves, the aqueous part escaping before the oily part catches fire. But it is best seen in quicksilver, which has been well called mineral water ; for this, without catching fire, by simple eruption and expansion almost equals gunpowder in strength ; and it is said to multiply the strength of gunpowder when mixed with it.

In like manner let the Nature investigated be the transitory Nature of Flame, and its instantaneous extinction. For it does not appear that the Nature of Flame has any fixed properties or consistency here among us, but is generated, as it were, every moment, and extinguished. For it is manifest in the case of flames, which here continue and endure, that the duration is not that of the same individual flame, but that it is made up of a succession of new flames generated in order, and that the flame does not remain numerically the same, as is easily seen from the fact that when the food or fuel of the flame is withdrawn it straightway perishes. Now, two ways meet about this Nature after this fashion. The instantaneous Nature arises either from the suspension of the cause which first originated it, as in the case of light, sounds, and violent motions, as they are called ; or because flame, though in its own Nature able to remain with us here, suffers violence and is destroyed by the contrary Natures which surround it.

And so we may take on this subject the following *Instance of the Cross*. We see, in the case of great fires, how high the flames ascend ; for the wider the base of the flame, the higher is its vertex ; and so it seems that the beginning of the extinction takes place about the sides, where the flame is compressed and worsted by the air. But the core of the flame, which the air does not reach, but which is surrounded on all sides by the flame, remains numerically the same, and is not extinguished until it has become gradually narrowed by the air which surrounds the sides. Thus all flame is pyramidal, broader at the base about the fuel, and narrow at the top, where the air opposes it and no fuel is forthcoming. But smoke is narrow at the base, and expands in rising, becoming like an inverted pyramid ; inasmuch as the air admits smoke and compresses flame. For let no one dream that flame is lighted air, since these are bodies quite heterogeneous.

But it will be a more accurate *Instance of the Cross*, and one better adapted to the purpose, if the thing can be made manifest by means of bicoloured flames. Take, for this purpose, a small metal stand, and fix in it a wax taper lighted ; place it in a basin, and pour round it a small quantity of spirit of wine, so as not to reach the top of the stand, then set fire to the spirit of wine. The spirit of wine will exhibit a bluish, the taper a yellowish flame. Note, therefore, whether

the flame of the taper (which may be distinguished from the flame of the spirit of wine by its colour ; for flames do not become mingled immediately, like liquids) remains pyramidal, or rather tends to a globular shape, when it finds nothing to destroy or compress it. If the latter is the case, it may be put down as certain that flame remains numerically the same, as long as it is shut up within another flame, and does not experience the hostile force of air.

And now we may have done with *Instances of the Cross*. We have treated them somewhat diffusely, to the end that men may gradually learn and accustom themselves to judge of Nature by means of *Instances of the Cross*, and light-bearing experiments, instead of by speculative reasonings.

xxxvii. Among *Prerogative Instances* we shall put in the fifteenth place, *Instances of Divorce*, which indicate the separation of those Natures which are of most frequent occurrence. Now they differ from the Instances subjoined to the *Instances of Companionship* in that the latter indicate separations of a Nature from some concrete with which it is familiarly associated ; while the present Instances indicate the separation of one Nature from another. They differ also from the *Instances of the Cross*, in that they determine nothing, but only advise us of the separation of one Nature from another. Their use is to disclose false Forms, and to dissipate vain contemplations suggested by what meets the sight, thus supplying a sort of ballast to the Intellect.

For example, let the Natures inquired into be those four Natures which Telesius will have to be messmates and chamber-fellows, viz., Heat, Brightness, Rarity, Mobility or Promptness to Motion. Now we find very many *Instances of Divorce* among them. For air is rare and easy of motion, but neither hot nor light ; the moon possesses light without heat ; hot water, heat without light ; the motion of an iron needle on a pivot is quick and agile, and yet its body is cold, dense, and opaque ; and many things of the same kind.

In like manner let the Natures inquired into be Corporeal Nature and Natural Action. For it appears that Natural Action is only found subsisting in some body. Yet in this case we may possibly find some *Instance of Divorce*. There is the magnetic action, by which iron is drawn to the magnet, heavy bodies to the globe of the earth. We may also add some other operations which take place at a distance. For action of this kind both takes place in time, and is measured by moments, not by mere points of time ; and in place by degrees and spaces. There is, therefore, some moment of time, and some interval of space, in which this virtue of action is suspended between those two bodies which originate the motion. And so the question amounts to this, whether these bodies, which are the limits of the motion, dispose or alter the intermediate bodies, so that, by a succession of actual contracts, the influence passes from limit to limit, meanwhile subsisting in the intermediate body ; or whether there is no such thing here, except the bodies, the influence, and the distances. And in the case of optical rays, sounds, heat, and some other things acting at a dis-

tance, it is probable that the intermediate bodies are disposed and altered ; the more so because they require a medium qualified to carry on such operations. But that magnetic or combining virtue admits of media, as it were, without distinction, nor is the virtue impeded in any kind of medium. And if that influence or action has nothing to do with the intermediate body, it follows that there is a natural virtue or action existing for a certain time and in a certain space without a body, since it neither exists in limiting nor in intermediate bodies. Wherefore that magnetic action will be an *Instance of Divorce* between Corporeal Nature and Natural Action. To which may be added, as a corollary or advantage not to be passed by, that even the philosophy which is drawn from the senses is not necessarily without a proof of the existence of essences and substances separate and incorporeal. For if a natural influence and action, emanating from a body, can exist for a certain time and in a certain place altogether without a body, it is probable that it can also emanate originally from an incorporeal substance. For it seems that corporeal nature is required no less for sustaining and carrying on natural action than for exciting or generating it.

xxxviii. There now follow five orders of Instances, which we are wont to call by one general name, *Instances of the Lamp*, or of *First Information*. They are those which assist the senses. For since all interpretation of Nature begins with the senses, and leads from the perception of the senses, by a straight, regular, and well-constructed way, to the perceptions of the Understanding, which are true Notions and Axioms, it necessarily follows that the more copious and exact the representations or reports of the sense itself, the more easily and prosperously will everything go on.

Now of these five *Instances of the Lamp* the first strengthen, enlarge, and rectify the immediate action of the senses ; the second make that an object of sense which was not such before ; the third indicate the continued processes or series of those things and motions which are, for the most part, unnoticed, except in their end and periods ; the fourth substitute something for the sense when it completely fails ; the fifth excite the attention and notice of the sense, and at the same time limit the subtlety of things. Of these we have now to speak separately.

xxxix. Among *Prerogative Instances* we shall put in the sixteenth place, *Instances of the Door or Gate* ; for so we call those which assist the immediate actions of the sense. Now among the senses sight holds clearly the first place in providing information ; for this sense, therefore, we must chiefly seek aid. Now aids to sight appear to admit of three divisions ; it may either perceive things which are not visible, or it may perceive them at a greater distance, or it may perceive them more exactly and distinctly.

Of the first class (omitting spectacles and the like, which avail only to correct and alleviate the infirmity of ill-constituted vision, and so give no further information) are the glasses lately invented ; for they show the latent and invisible details of bodies, their hidden structures

and motions, by greatly increasing their apparent size ; by the help of which the exact figure and outline of body in fleas, flies, and worms, as well as colours and motions previously invisible, are seen to our astonishment. Moreover, they say that a straight line drawn with a pen or pencil appears through such glasses very uneven and crooked ; the truth being that neither the motion of the hand, although assisted by a ruler, nor the impression of the ink or colours is really even, although the inequalities are so minute as not to be discerned without the aid of such glasses. And men have superadded a sort of superstitious observance in this matter (as is the case in things new and wonderful), viz., that glasses of this kind confer honour on the works of Nature, but dishonour those of Art. But this only means that natural textures are much more subtle than artificial ones. For this instrument is only effective for minute objects ; so that if Democritus had seen such a glass, he would perhaps have jumped for joy, and have thought that a means had been discovered for detecting the atom (which he affirmed was altogether invisible). But the incompetency of such glasses, except for minutiae (and even for them when they exist in a body of some size), does away with their utility. For if the invention could be extended to larger bodies, or to the details of larger bodies, so that the texture of linen cloth might appear like a net, and if in this manner the hidden details and inequalities of gems, liquids, urine, blood, wounds, and many other things might be discerned, then, without doubt, great advantages might be reaped from that invention.

Of the second class are those other glasses, which Galileo has taken such pains to invent, by the aid of which, as if by means of boats and vessels, a nearer intercourse with the heavenly bodies can be commenced and carried on. For hence we learn that the galaxy is a knot or collection of small stars, entirely separate and distinct from one another—a fact which the ancients only suspected. Hence it seems to be shown that the spaces of the planetary orbits, as they are called, are not entirely devoid of stars ; but that the heavens begin to fill with stars before we come to the starry sphere itself, although these are smaller, too small, indeed, to be seen without glasses. By this means we can see certain smaller stars circling about the planet Jupiter (whence it may be conjectured that there is more than one centre of motion among the stars). By this means the inequalities of light and shade in the moon are more distinctly seen and placed ; so that a sort of selenography might be made. By this means the spots in the sun and similar things are discerned ; all indeed noble discoveries, so far as we can safely place faith in demonstrations of this kind. But we regard these things with especial suspicion, because experiment stops with these few observations ; and many other things, equally worthy of investigation, are not discovered by the same plan.

Of the third class are rods for measuring land, astrolabes, and the like, which do not enlarge the sense of vision, but rectify and direct it. And if there be other Instances which help the remaining senses in their immediate and individual action, and yet are of such a kind as to add nothing to the information at present possessed, they make

not to our present business, and so we have not made mention of them.

xi. Among *Prerogative Instances* we shall put in the seventeenth place, *Summoning Instances*, borrowing the term from the courts of law, because they summon those things to appear which have not appeared before: we also call them *Evoking Instances*. They bring within the reach of the senses things which were previously beyond them.

Now a thing escapes the senses, either on account of the distance of the object in space; or on account of the interruption of the senses by means of intermediate bodies; or because the object is not fitted to make an impression on the senses; or because it is too deficient in quantity to strike the senses; or because there is not sufficient time for it to act upon the senses; or because the collision with the object is too much for the sense to bear; or because some object had previously filled and taken possession of the sense, so as to leave no room for a new motion. And these conditions principally apply to vision, to and secondarily the touch. For these two senses give information at large, and concerning common objects, whereas the other three give scarcely any information, except what is immediate and concerning objects peculiar to them.

1. In the first class, when a thing cannot be discerned, on account of its distance, it is only brought within reach of the senses by adding or substituting something else which can provoke and strike the senses at a greater distance, as in the case of signalling by fires, bells, and the like.

2. In the second class this reduction to the senses takes place when things which are obscured by the interposition of bodies, and cannot conveniently be opened out, are brought within range of the senses by the aid of something that lies on the surface or comes forth from the interior. Thus the state of the human body is discerned by the pulse, the urine, and the like.

3. 4. But the reductions to the senses of the third and fourth kind admit of many applications, and in our inquiry into things should be sought for on all sides. For example, it is clear that air and spirit, and things of the kind, which are in their whole substance rare and subtle, can neither be seen nor touched. Wherefore in the investigation of bodies of this kind there is especial need of reduction.

So let the Nature inquired into be the Action and Motion of the Spirit which is enclosed in tangible bodies. For everything which we have that is tangible contains an invisible and intangible spirit, which it surrounds and clothes like a garment. Hence that threefold source, so potent and marvellous, of the process of spirit in a tangible body. For spirit in tangible matter, when got rid of, causes the bodies to contract and dry up; when detained, softens and melts them; when neither wholly got rid of nor wholly detained, moulds them, gives them limbs, assimilates, ejects, organizes, and the like. And all these things are brought within reach of the senses by their conspicuous effects.

For in every tangible inanimate body the enclosed spirit first multiplies itself, and, as it were, feeds upon those tangible parts which are most adapted and prepared for so doing ; it digests, elaborates, and changes them into spirit, and then they escape together. And this elaboration and multiplication of spirit is brought within reach of the senses by diminution of weight. For in all dessication something is lost in quantity : this is the case not only with the spirit previously existing in the body, but also with the body itself, which before was tangible, and has lately been changed ; for spirit is without weight. Now the egress or emission of the spirit is brought within reach of the senses in the rust of metals and other putrefactions of the kind, which stop before they come to the rudiments of life ; for these belong to the third kind of process. For in the more compact bodies the spirit, not finding any pores and passages by which to escape, is compelled to protrude and drive before it the tangible parts themselves, so that they go out with it, and thence comes rust and the like. And the contraction of the tangible parts, after some of the spirit has been sent out (whence follows that dessication which we spoke of), is brought within reach of the senses both by the increased hardness of the body, and still more by the rents, contractions, corrugations, and complications of the bodies which thence follow. For the parts of wood fly apart and are contracted, skins are corrugated, and not only so, but (if there be a sudden emission of the spirit by the heat of fire) the contraction is so rapid as to curl and roll them up.

But on the other hand, when the spirit is detained, and yet is expanded and excited by heat or something analogous (as is the case in the more solid or tenacious bodies), then the bodies are soft, as iron while hot ; they become fluid, as the metals ; they become liquid, as the gums, wax, and the like. Thus the contrary operations of heat (*viz.* the hardening by it of some substances, the dissolving of others) are easily reconciled ; inasmuch as in the former the spirit is emitted, in the latter it is agitated and detained : whereof the melting is the peculiar action of the heat and spirit ; the hardening is the action of the tangible parts only, occasioned by the emission of the spirit.

But when the spirit is neither detained altogether nor emitted altogether, but only makes trial and experiment within its own bounds, and finds the tangible parts obedient and disposed to follow it, so that, whither the spirit goes, thither they follow with it ; then succeeds the formation of an organic body, the production of limbs, and the other vital actions which take place in vegetables as well as animals. And these things are best brought within reach of the senses by diligently remarking the first beginnings and rudiments or attempts of life in animalculæ generated from putrefaction ; as in the eggs of ants, worms, flies, frogs after rain, &c. But the production of life demands both mildness in the heat and pliancy in the body, so that the spirit may neither burst forth through over haste, nor be restrained by the obstinacy of the parts, but may rather be able to mould and fashion them after the manner of wax.

Again, that most noble distinction of spirit, which has so many

relations (viz. of spirit cut off, spirit simply branching, spirit at once branching and cellulate ; of which the first is the spirit of all inanimate bodies, the second that of vegetables, the third that of animals), is placed before the eyes by multiplied Instances of reduction.

In like manner it is clear that the more subtle textures and structures of things (visible and tangible, it may be, in the whole body) are neither seen nor touched. Wherefore in these cases also our information is advanced by reduction to the senses. But the most radical and primary distinction of structures is found in the abundance or scantiness of material, which fills the same space or dimensions. For other structures (which refer to the dissimilarity of parts contained in the same body, and to their collocations and postures), when compared with the former, are but secondary.

Let, therefore, the Nature inquired into be the respective Expansion or Coition of Matter in bodies ; viz., the proportion of matter to space of each. For there is nothing truer in Nature than the twin propositions, "Nothing is made from nothing," and, "Nothing is reduced to nothing," but that the actual quantity or sum total of matter is constant, without increase of diminution. Nor is it less true, "That of that quantity of matter, the spaces or dimensions being the same, more or less is contained according to the diversity of bodies," as in water more, in air less ; so that to assert that a given volume of water can be changed into a given volume of air is the same as to say that something can be reduced to nothing. On the other hand, to assert that a given volume of air can be changed into an equal volume of water is the same as to say that something can be made out of nothing. And it is from this abundance and scarcity of matter that the notions of density and rarity, so variously and promiscuously entertained, are properly abstracted. We must also assume a third proposition, which is also sufficiently certain, "That this greater or less quantity of matter, existing in various bodies, can, by comparison, be reduced to calculation, and to exact, or nearly exact, proportions." Thus it would not be wrong to say that there would be in a given volume of gold such an accumulation of matter, that spirit of wine, to provide an equal quantity of matter, would need twenty-one times the space filled by the gold.

Now the accumulation of matter and its ratios are brought within reach of the senses by means of Weight. For weight answers to the quantity of matter in the parts of a tangible body ; but the spirit and its quantity of matter do not admit of computation by weight, for it rather lessens weight than increases it. But we have made a sufficiently accurate table on this subject, in which we have set down the weights and volumes of individual metals, the principal stones, woods, liquids, oils, and very many other bodies, natural and artificial ; a thing of use in many ways, as well for the light of information as for a guide in operation, and one which reveals many things altogether beyond our expectation. Nor is it to be thought a trifle that it demonstrates that all the variety which is found in the tangible bodies known to us (we mean such bodies as are well compacted, and not

such as are quite spongy, hollow, and in great part filled with air) does not exceed the ratio of one to twenty-one; so limited is Nature, or at least that part of it of which it is our business principally to deal.

We have also thought it worth while to try whether it is possible to find the ratios borne by non-tangible or pneumatic bodies to tangible ones. This we have attempted by the aid of the following contrivance. We took a glass phial, capable of containing about an ounce, using a vessel of small size, that the subsequent evaporation might be produced by a smaller expenditure of heat. This phial we filled nearly to the neck with spirit of wine; choosing spirit of wine because, by the above-mentioned table, we observed that it was the rarest of those tangible bodies which are compact and not hollow, and that it contained the least matter for the space it filled. Then we noted carefully the weight of the spirit with the phial. Afterwards we took a bladder, holding about two pints; from it we pressed out all the air possible, until both sides of the bladder met. We first rubbed the bladder over gently with oil, to make it air-tight, the oil stopping up whatever pores it had. We next tied the bladder tightly about the mouth of the phial, with a thread waxed to make it stick better and bind more closely, the mouth of the phial fitting inside that of the bladder. We then placed the phial over burning coals in a fireplace. After a while, the vapour or breath of the spirit of wine expanded, and became changed into vapour by the heat, gradually inflating the bladder, and dilating it in all directions like a sail. As soon as this took place, we removed the glass from the fire, and placed it on a carpet, that it might not crack with the cold; and at once made a hole in the top of the bladder, to prevent the vapour from returning into liquid on the cessation of the heat, and so confusing our calculations. We then removed the bladder itself, and again took the weight of the spirit of wine which remained. Thence we computed how much had been consumed in producing vapour or air, and comparing the space which the body had filled when it was in the state of spirit of wine in the phial with that which it occupied after it had become pneumatic in the bladder, we ascertained the ratios; from which it was quite clear that the body so turned and changed had expanded into a bulk an hundred times greater than it had filled before.

In like manner let the Nature inquired into be Heat or Cold, so weak in degree as not to be perceptible to the senses. These are brought within reach of the senses by a heat-glass, such as we have described above. For heat and cold are not themselves perceptible to the touch; but heat expands air, cold contracts it. Nor again is that expansion and contraction of the air perceptible to the sight, but the expansion of the air depresses the water; its contraction elevates it, and so, at last, is brought under the cognisance of the sight; not before, nor otherwise.

In like manner let the Nature inquired into be the Mixture of Bodies, viz. what of water, oil, spirit, ashes, salts, and the like, they contain; or, as a particular Instance, how much butter, curd, serum, and the like, there is in milk. These mixtures are brought within

reach of the senses, as far as regards what is tangible, by means of artificial and skilful separations. But the Nature of the spirit in them, though not immediately perceived, is yet discovered by the various motions and struggles of the tangible bodies in the very act and process of their separation, and also by the acridities, corrosions, the different colours, odours, and tastes of the same bodies after separation. And in this department men have laboured hard with distillations and artificial separations, but with no greater success than in the other experiments hitherto in use : for they have been groping altogether in the dark, following blind paths, and working with far more zeal than intelligence ; and (what is the worst) they have not imitated or emulated Nature, but have destroyed (by the use of violent heats, or too powerful influences) all the more subtle structure, in which the hidden virtues and sympathies of things have their principal seat. Nor do men usually remember or observe, in preparations of this kind, that other fact which we have elsewhere pointed out ; which is, that during the trial of bodies, both by fire and other methods, very many qualities are implanted in them by the fire itself, and by those bodies which are introduced to promote the separation, which were not previously in the compound ; and hence have arisen strange fallacies. For it is not true that all the vapour, which is given off from water under the influence of fire, was previously existing as vapour or air in the body of the water : it is caused principally by the dilation of the water from the heat of fire.

In like manner, generally speaking, all the exquisite tests of bodies, whether natural or artificial, by which what is real is distinguished from what is adulterated, what is better from what is worse, should be referred to this head, for they bring within the reach of the sense what was previously beyond it. They must therefore be collected from all sides with diligent care.

5. As regards the fifth way in which objects escape the senses, it is clear that the action of sense is carried on in motion, and motion in time. If, therefore, the motion of any body is either so slow, or so quick, as to bear no proportion to the minute portion of time in which the action of the sense is carried on, the object is not perceived at all, as in the motion of the hand of a clock, and again in the motion of a musket-ball. And motion which is too slow to be perceptible is easily and ordinarily brought within reach of the sense by summing it ; while motion which is too quick has not yet been fairly measured ; and yet the inquiry into Nature demands that this be done in some cases.

6. The sixth kind, in which the senses are hindered by the nobility of the object, admits of reduction, either by increasing the distance between the object and the sense ; by deadening it by the interposition of such a medium as will weaken without annihilating it ; or by admitting and receiving the reflection of the object, where the direct impression is too strong, as that of the sun in a basin of water.

7. The seventh kind is where the sense is so burdened with one object as to leave no room for the admission of a new one. This is chiefly the case with the sense of smell, and with odours ; and has

little to do with the subject before us. And so we have now said enough concerning the bringing within the reach of the senses objects previously beyond them.

Sometimes, however, the reduction is not made to the senses of man, but to that of some other animal, whose sense in some points excels that of man : as of certain scents to the sense of a dog ; of the light which is latent in air, when not illuminated from without, to the sense of a cat, owl, and other animals which see by night. For Telesius was right in remarking that there is in the air itself a certain original light, though faint and rare, and for the most part useless to the eyes of man and most animals : since those animals to whose sense this light is adapted see by night, which it can scarcely be believed they do without light, or by a light within them.

It should also be observed that we are here treating of the shortcomings of the senses, and their remedies. For the fallacies of the senses must be referred to the particular inquiries concerning sense, and the objects of sense ; excepting that great fallacy of the senses, whereby they draw the lines of things with reference to man, and not with reference to the universe ; and this is not to be corrected except by reason and a universal philosophy.

xli. Among *Prerogative Instances* I shall put in the eighteenth place, *Instances of the Road*, which we are wont to call also *Travelling Instances*, and *Articulate Instances*. They are those which indicate the motions of Nature in their gradual progression. Now this kind of instances escapes the observation rather than the sense. For men are marvellously careless about this matter. They contemplate Nature desultorily and at intervals, and when bodies are finished and completed, and not when she is at work upon them. Yet if any one wished to examine and contemplate the contrivances and industry of an artificer, he would not care to see merely the rude materials of the art, and then the perfect work, but would wish to be present when the artificer is at his labours, and carrying forward his work. And something similar ought to be done with regard to Nature. If any one inquires into the vegetation of plants, he must begin from the very sowing of the seed, and see (as he may easily do by taking up day by day seeds that have been lying in the ground two, three, four days, and so on, and carefully inspecting them) how and when the seed begins to enlarge and swell, and, as it were, to be filled with spirit ; next, how it bursts the rind, and sends forth fibres, slightly raising itself up in the meanwhile, unless the earth be very stubborn ; how also it sends out thin fibres, some as roots downwards, some for stems upwards, sometimes also creeping sideways, if it finds the earth on that side open and more easy of access ; and many other things of the kind. We should do the same with the hatching of eggs, in which case we shall find it easy to watch the process of vivification and organization, and see what parts are produced from the yolk, and what from the white of the egg, and other things. There should be a similar method with regard to the production of animals from putrefaction. For it would be inhuman to prosecute this inquiry upon

perfect terrestrial animals, by cutting out the fœtus from the womb ; except as we may take advantage of abortions, animals killed in hunting, and the like. There should, therefore, be kept up a sort of strict vigil over Nature, as being more easily observed by night than by day. For these contemplations may be considered as night-watches, on account of the smallness of our light and its continual employment.

And the same should be tried in the case of inanimate things, as we have done ourselves in inquiring into the expansion of liquids by fire. For there is one mode of expansion in water, another in wine, another in vinegar, another in verjuice, and quite another in milk and oil ; as it was easy to see by boiling them over a gentle fire, and in a glass vessel, in which the whole actions might be clearly distinguished. But we touch lightly on these things, intending to discourse upon them more fully and exactly when we come to the discovery of the *Latent Process* of things. For it must always be borne in mind that in this place we are not treating of things themselves, but merely adducing examples.

xlii. Among *Prerogative Instances* we shall put in the nineteenth place, *Supplementary* or *Instances of Substitution*, which we also call *Instances of Refuge*. They are those which supply information where the sense is entirely at fault, and in which we therefore take refuge when appropriate Instances cannot be had. Now this substitution takes place in two ways, either by gradation or by analogy. For example : there is no medium discovered which can entirely prevent the magnet from attracting iron. Gold when interposed does not do so, nor yet silver, stone, glass, wood, water, oil, cloth, or fibrous bodies, air, flame, &c. But yet by accurate tests some medium may perhaps be found to deaden its virtue more than anything else, that is to say, comparatively and in some degree ; thus it may be found that the magnet does not attract iron through a thick lump of gold as well as through an equal space of air, or through a mass of ignited silver as well as through a mass of equal size when cold, and so in other cases. For we have not made trial of these things ourselves, but it is sufficient to propose it by way of example. In like manner no body is found with us which is not susceptible of heat when brought near the fire. And yet air contracts heat far more quickly than stone. And such is the substitution which takes place by degrees.

Substitution by analogy is unquestionably useful, but it is less sure, and must therefore be applied with some discretion. It is used when things not perceptible to the sense are brought within its reach, not by perceptible operations of the imperceptible body itself, but by the contemplation of some cognate body which is perceptible. For example, let inquiry be made concerning the Mixture of Spirits, which are invisible bodies. There seems to be a certain relationship between bodies and what serves as their food or aliment. Now the food of flame seems to be oil and fatty matters ; of air, water and watery matters ; for flame multiplies itself over the exhalation of oil, and air over the vapours of water. We must therefore look to the

mixture of water and oil, which manifests itself to the sense, since the mixture of air and flame escapes the sense. But oil and water, which are very imperfectly mingled together by composition and agitation, are yet exactly and delicately mingled in herbs, blood, and the parts of animals. And so something similar may possibly take place in the mixture of flame and air in spirituous bodies, which, though they do not really undergo mixture by simple juxtaposition, yet appear to be mingled in the spirits of plants and animals, especially as all animate spirit feeds upon both kinds of moisture, viz. the watery and the fatty, as its proper aliment.

In like manner, if the inquiry be not into the more perfect Mixtures of Spiritual Bodies, but only into their composition—viz. whether they are easily incorporated one with another, or whether there be not rather, for example, some winds and exhalations, or other spiritual bodies, which are not mixed with common air, but only stand and float in it in globules and drops; and are rather broken and crushed by the air, than taken into and incorporated with it; this cannot become perceptible to the sense in the case of common air, and other spirituous bodies, on account of their subtlety; yet we may see a certain image of the way in which the thing takes place from the example afforded by such liquids as quicksilver, oil, and water; and also of air and its division, when it is dispersed and rises in little globules through water; also in thick smoke; and lastly in dust, raised and remaining in the air; in all of which cases there is no incorporation. And the representation which we have set forth on the subject is not a bad one, if inquiry be first diligently made, whether there can be such a difference of character among spiritual bodies as is found among liquids, for then these representations by analogy may be conveniently substituted.

And for that we said that information could be drawn from these Supplementary Instances by way of *refuge*, when proper Instances are wanting; we wish it nevertheless to be understood, that they are of great value, even when the proper *Instances* are within reach—for the purpose, we mean, of corroborating the information which the others supply. But of these we shall speak more exactly when we come to that part of our discourse which treats of the supports of Induction.

xlili. Among *Prerogative Instances* we shall put in the twentieth place, *Dissecting Instances*, which we call also *Plucking Instances*, but for a different reason. We call them *Plucking* because they *pluck* the Understanding, *Dissecting*, because they *dissect* Nature, whence we also sometimes call them *Instances of Democritus*. They are those which remind the Understanding of the admirable and exquisite subtlety of Nature, so as to rouse and awaken it to attention, observation, and due investigation. For example, that a little drop of ink spreads over so many letters or lines; that silver, gilded on the outside only, may be drawn out into so great a length of gilded wire; that a little worm, such as is found in the skin, has in it at once spirit and a structure comprising different parts; that a little saffron tinges

a cask of water with its colour; that a little civet or aromatic scent imparts its odour to a far greater volume of air; that a little incense raises so great a cloud of smoke; that such minute differences of sound as articulate words are carried every way through the air, and penetrate through the openings and pores even of wood and water (though with considerable diminution), nay, are even echoed back, and that so distinctly and speedily; that light and colour pass through the solid bodies of glass and water to ever so great an extent, and so quickly, and with so exquisite a variety of images, and are even refracted and reflected, that the magnet acts through bodies of all kinds, even the most compact; and, what is more wonderful, that in all these cases, in an indifferent medium, such as air, the action of one does not greatly impede action of another; that is to say, that at the same time there are carried through spaces of air so many images of visible objects, so many percussions of articulate sound, so many individual odours, as of the violet and the rose, also heat and cold, and magnetic influences; all (I say) at the same time, no one interfering with the other, as if they had each its own peculiar and separate road and passage, and none ever touched or ran against another.

We find it expedient, however, to subjoin to these *Dissecting Instances*, *Instances* which we call *Limits of Dissection*. Thus, in the cases we have mentioned, one action does not disturb or impede another of a different kind, but one instance does subdue and extinguish another of the same kind, as the light of the sun the light of a glowworm, the sound of cannon the voice, a strong odour one which is more delicate, a fierce heat one of less intensity, plates of iron, placed between the magnet and another piece of iron, the influence of the magnet. But of these things also the proper place will be among the helps of Induction.

xliv. We have now spoken concerning the *Instances* which aid the sense, which are chiefly useful for the *Informative Part*. For information begins with sense. But our whole work ends in *Practice*; and as information is the beginning, so practice is the end of the matter. The *Instances* which follow, therefore, are chiefly of use for the *Operative Part*. They are of two kinds, and are seven in number, all of which we call by the general name of *Practical Instances*. In the *Operative Part* there are two defects, and two kinds of serviceable *Instances*. *Practice* either deceives or overburdens us with work. It deceives chiefly after diligent inquiry into Nature by its inaccurate determination and measurement of the forces and actions of bodies. Now forces and actions of bodies are circumscribed and measured, either by distance of space, or by the elements of time, or by union of quantity, or by predominance of influence; and unless these four things be honestly and diligently weighed, our Sciences will be fair perhaps in theory, but sluggish in operation. Now the four *Instances* which relate to this question we call by the general name of *Mathematical Instances* and *Instances of Measurement*.

And Practice becomes burdensome either through the admixture of

useless things, or through the multiplication of instruments, or through the mass of materials and of bodies which happen to be required for any work. Those Instances ought, therefore, to be valued which either direct practice to those points which most concern mankind, or which economize instruments and material. Now the three Instances which refer to this question we call by the general name of *Propitious* or *Benevolent Instances*. Of each of these seven Instances we shall now speak separately, and with them conclude that part of our work which relates to the Prerogatives or Ranks of Instances.

xlv. Among *Prerogative Instances* we shall put in the twenty-first place, *Instances of the Rod*, or *of the Radius*, which we also call *Instances of Carrying through* or *Non ultra*. For the virtues and motions of things operate and take effect in spaces, not indefinite or accidental, but finite and certain; so that to find and mark these in the investigation of individual Natures is of the greatest importance to practice, not only to prevent errors, but also to render it more extensive and influential. For we are sometimes allowed to extend these virtues, and, as it were, to diminish their distances, as in the case of telescopes.

And most virtues operate and affect by manifest contact alone, as is the case in the impact of two bodies, where the one does not remove the other unless the impinging body touches the other. Again, medicines which are applied externally, as unguents, and plasters, do not exercise their virtues without touching the body. Lastly, the objects of the senses of taste and touch do not strike the organs unless they are contiguous to them.

There are also other virtues which operate at a distance, though a very small one, and of these but a few have hitherto been observed; they are, however, more than men suspect: as (to take examples from well-known things) when amber and jet attract straws; one bubble brought near another breaks it; some purgative medicines draw humours downwards, and the like. But that magnetic virtue which brings together iron and the magnet, or two magnets, operates within a fixed but small circle; while, on the other hand, if there be any magnetic virtue flowing from the earth (a little below the surface), and affecting the steel needle in its polarity, it must operate at a great distance.

Again, if there be any magnetic force which operates by sympathy between the globe of the earth and heavy bodies; or between the globe of the moon and the waters of the sea (which appears highly probable, from the fact of the Spring and Neap tides happening twice a month); or between the starry heavens and the planets, by which they are attracted and raised to their apogees; all these must operate at very great distances. Certain materials are also found which inflame, or catch fire, at considerable distances, as Babylonian naphtha is said to do. Heat also insinuates itself at great distances, as also does cold; so that the inhabitants of Canada feel at a great distance the cold given off by the mounds or masses of ice which breaking loose and floating about the Northern Ocean, are carried over the

Atlantic to their shores. Odours also (though in these there always seems to be a certain corporeal discharge) operate at remarkable distances; as men often find who sail near the coast of Florida, or some parts of Spain, where there are whole forests of lemon and orange trees, and other odoriferous plants, or shrubs of rosemary, majoram, and the like. Lastly, the radiations of light, and impressions of sound, operate at vast distances.

But all these powers, whether the distance at which they operate be small or great, act certainly at distances finite and known to Nature, so that there is a certain limit which is never exceeded, and that proportioned either to the mass or quantity of matter in the bodies, or to the strength or weakness of the virtues, or to the favourable or hostile disposition of the media; all which conditions should be reckoned and noted down. Moreover the measures of violent motions, as they call them, as of missiles, projectiles, wheels, and the like, should be observed, since these also have clearly their own fixed limits.

There are found also certain motions and influences of a contrary nature to those which operate by contact and not at a distance; those, we mean, which operate at a distance, and not by contact; and again, those which operate more slowly at a less distance, and more strongly at a greater. Vision, for instance, does not succeed well in contact, but requires a medium and a certain distance. Yet I remember to have heard from a person worthy of credit, that he himself, while undergoing the operation for the cure of the cataract (which was performed by introducing a small silver needle within the first coat of the eye, to remove the pellicle of the cataract, and push it into a corner), most clearly saw the needle moving over the pupil. But though this may be true, it is clear that large bodies are not well or distinctly seen, except at the vertex of the cone, where the rays from the object converge at some distance from the eye. Moreover the eyes of aged people see objects better when at a distance than when nearer. And in the case of missiles, it is certain that the percussion is not so violent at a very short distance as it is a little further off. These, therefore, and the like points should be observed in the measurement of motions with reference to distances.

There is also another kind of measurement of motion in space which must not be passed by. It deals with motions which are not progressive but spherical, that is, with the expansion of bodies into a larger, or their contraction into a lesser. For in measuring this kind of motion, we must inquire how far the bodies will endure compression or extension according to their Nature, easily and readily, and at what limit they begin to resist, so that at last they come to a limit beyond which they will bear no more; as when an inflated bladder is squeezed it allows a certain compression of the air, but, if this be carried too far the air does not endure it, and the bladder bursts.

But we proved this more exactly by a more delicate experiment. We took a small bell of metal, light and thin, such as is used to contain salt, and plunged it into a basin of water, so that it carried down with it to the bottom of the basin the air contained in its cavity. We had

previously placed at the bottom a small globe, on which the bell was to be set. By this means we discovered that if the globe was small (in proportion to the cavity) the air retired into a smaller space, and was pressed together without being thrust out : but if the globe was too large for the air to yield readily, then the air, impatient of the increased pressure, raised the bell on one side, and began to ascend in bubbles.

Again, to test the degree of extension (as well as of compression) which the air would endure, we made use of the following means. We took an egg of glass, with a small hole at one end ; we exhausted the air by violent suction, and immediately closed the opening with our finger ; we then plunged the egg into water, and lastly removed our finger. The air being constrained by the suction, and being expanded beyond its natural limits, and so struggling to recover and contract itself (so that if the egg had not been immersed in water, it would have drawn in the air with a hissing noise), now drew in water in sufficient quantities to allow the air to recover its former volume or dimensions. Now it is certain that rare bodies, like air, will undergo a visible amount of contraction, as has been said ; but tangible bodies, such as water, admit compression much more impatiently, and to a less degree. How much they do admit we have investigated in the following experiment.

We caused to be made a hollow globe of lead, containing about two wine pints, and sufficiently thick at the sides to support considerable pressure. We poured water into it through a hole which we had made in it ; and when the globe was filled, we stopped up the hole with melted lead, so that the whole became quite solid. We then flattened the globe on two opposite sides with a heavy hammer, thus forcing the water into a smaller space, the sphere being the figure of greatest capacity. And when the hammering ceased to take effect, through the resistance offered by the water to further contraction, we employed a mill or press ; untill at last the water, impatient of further pressure, exuded through the solid lead in the shape of a fine dew. We afterwards computed the space lost by the compression, and understood that the water had undergone a corresponding degree of compression, but not until subjected to a great amount of violence.

But solid bodies, and those that are dry and more compact, such as stone, and wood, and also metals, endure a still less degree of compression or extension ; such indeed as to be scarcely perceptible ; for they free themselves by breaking, by progression, or by other efforts ; as is apparent in the curvature of wood or metal, in clocks moved by coiled springs, in missiles, hammerings, and countless other kinds of motions. And all these, with their measures, are to be marked and explored in the investigation of Nature ; either to a certainty, or by estimation, or by comparison, as opportunity shall offer.

xlvi. Among *Prerogative Instances* we shall put in the twenty-second place, *Instances of the Course*, which we also call *Instances of the Water* ; borrowing the word from the clocks of the ancients, into which water was poured in the place of sand. They measure Nature

by moments of time, just as the *Instances of the Rod* do by degrees of space. For all natural motion or action is transacted in time, some more quickly, others more slowly, but all in moments which are determined, and known to Nature. Even those actions which seem to be performed suddenly, and in the twinkling of an eye (as we say), are found to admit of degrees in respect of time.

First, then, we see that the return of the heavenly bodies is performed in calculated periods, as also the flow and ebb of the sea. And the motion of heavy bodies towards the earth, and that of light bodies towards the circumference of the heavens, takes place in definite moments, according to the Nature of the body moved, and of the medium in which it moves. The sailing of ships, the movements of animals, the transmission of missiles, all take place in times, the sums of which admit of calculation. And as regards heat, we see boys during winter bathing their hands in flame, without being burned; and jugglers can, by agile and equable movements, turn vessels full of wine or water upside down, and bring them up again, without spilling the liquid; and many other similar instances. In like manner the compressions, dilations, and eruptions of bodies take place, some quickly, others slowly, according to the Nature of the body, and of the motion, but all in definite periods. Moreover, in the explosion of several cannon at once, which is heard sometimes to the distance of thirty miles, the sound is perceived by those who are near sooner than by those who are further off. And in vision (where the action is most rapid) it is clear that certain moments of time are required for its accomplishment, as is proved in the case of those objects which from the velocity of their motion are invisible; for instance, the discharge of a bullet from a musket. For the passage of the bullet is too rapid to allow of an impression of its image being conveyed to the sight.

And this fact, with others like it, has at times suggested to us a strange doubt; viz. whether the face of a clear and starlight heaven is seen at the time it really exists, or a little later; and whether there be not (as regards vision of the heavenly bodies) a real time, and an apparent time, no less than a true place, and an apparent place, as noted by astronomers in the case of parallaxes. So incredible did it seem to us that the images or rays of the heavenly bodies should be instantaneously conveyed to the sight through such an immense space, and not rather take a noticeable time in travelling. But that suspicion (as to the existence of any great interval between the real and the apparent time) afterwards entirely vanished, when we took into account the infinite loss and diminution of quantity, caused by distance, between the real body of a star and its appearance; and at the same time observed the great distance (sixty miles at least) at which bodies which are merely white are instantaneously discovered here on earth; while there is no doubt that the light of heavenly bodies exceeds many times, in strength of radiation, not merely the vivid brilliancy of whiteness, but also the light of every flame known to us. Again, the immense velocity of the bodies themselves, as perceptible

in the diurnal motion, (which has so astonished grave men, that they preferred believing that the earth moved), makes that motion of radiation (although, as we said, marvellous in its quickness) more credible. But the consideration which moved us most of all was that if any perceptible interval of time were interposed between the real and the apparent, it would happen that the appearances would often be intercepted and confused by rising clouds, and similar disturbances of the medium. And now sufficient has been said about the simple measures of time.

But we have not only to seek the simple measure of motions and actions, but, what is much more important, their comparative measure, for that is of immense use and of wide application. We see that the flash of a gun is seen sooner than its report is heard, although the ball must necessarily strike the air before the flame behind it can get out ; now the cause of this is, that the motion of light takes place more rapidly than that of sound. We see also, that visible images are taken up by the sight more quickly than they are dismissed ; whence it happens that the strings of a fiddle, struck by the finger, are doubled and trebled in appearance, because a new image is received before the old one is dismissed ; so it also happens that revolving rings assume a spherical appearance ; a blazing torch carried hastily at night seems to have a tail. Also upon this inequality of motions, as regards velocity, Galileo built up his theory of the flowing and ebbing of the sea ; imagining that the earth revolved faster than the waters, whence the waters gathered themselves up in a heap, and then in turn relaxed and fell, as is shown in the case of a vessel of water moving quickly. But for this speculation he demands data which cannot be allowed (*viz.* that the earth moves), and besides we have not sufficient information as to the tidal motion of the ocean every six hours.

But we have a conspicuous example of the matter in hand, namely, of the comparative measures of motions, and not only of the thing itself, but also of its singular use (of which we spoke a little while ago) in mines charged with gunpowder, whereby vast masses of earth, buildings, and the like, are upheaved and thrown into the deep by an insignificant quantity of powder. The cause of this undoubtedly is, that the expanding motion of the powder, which is the impelling force, is many times quicker than the motion of gravity, which resists it ; so that the former motion is accomplished before the opposing motion begins, and thus at the outset the resistance is a nullity. Hence it is not the strong blow, or the sharp and rapid one, which is most effective in projecting all kinds of missiles. Nor would it be possible that the small quantity of animal spirit in animals, especially in such vast bodies as those of whales, or elephants, could lead and govern such a large mass of body, were it not for the velocity of the motion of the spirit, and the slowness of the bodily mass in exciting its resistance.

Indeed, this is a principal foundation of the experiments in magic, about which we shall speak presently, where a small mass of matter

overcomes a far greater mass, and reduces it to order ; I mean the possibility of one of two motions getting the start of the other, and anticipating its action.

Lastly, this same distinction of *earlier* and *later* should be observed in all natural action. Thus in an infusion of rhubarb the purgative property is extracted first, the astringent afterwards ; something similar to which we have found in the infusion of violets in vinegar, where the sweet and delicate odour of the flower comes off first, and then the more earthy part, which spoils the scent. And so if violets are steeped for a whole day, the odour comes off more feebly than if the flowers be steeped for a quarter of an hour only, and then taken out ; and, since the scented spirit residing in the violet is small, if fresh violets be introduced every quarter of an hour, renewing them as many as six times, the infusion is at last so enriched, that although the violets have not remained in it, taking all their renewals into account, more than an hour and a half, yet a most grateful scent is left behind, as strong as that of the violet itself, and lasting for a whole year. Yet it must be observed that the odour does not gain its full strength until a month after infusion. And in the distillation of aromatic herbs steeped in spirits of wine, it appears that there rises first a watery and useless phlegm, then water containing more of the spirit of wine, and lastly water containing more of the aroma. And in this way there are to be found in distillations a very great number of facts worthy of observation. But these may suffice for examples.

xlvii. Among *Prerogative Instances* we shall put in the twenty-third place, *Instances of Quantity*, which we also call *Doses of Nature* (borrowing the word from medicine). They are those which measure virtues by the *quantities* of bodies, and show what the *quantity of the body* has to do in producing the *mode of the virtue*. And first there are some virtues which subsist only in a cosmical quantity, that is, in such a quantity as has agreement both with the configuration and fabric of the universe. For instance, the earth stands fast, its parts fall. The waters in seas flow and ebb, but not in rivers, except through the entrance of the sea. Then, again, almost all particular virtues operate according to the greater or less quantity of the body. Large masses of water are not easily corrupted, small ones quickly. Wine and beer come to maturity, and become drinkable much more quickly in bottles than in large casks. If a herb be steeped in a large quantity of liquid, infusion takes place rather than imbibition ; if in a smaller quantity, imbibition rather than infusion. Thus a bath is one thing in its action on the body, a slight sprinkling another. Again, slight dews never fall in the air, but are dispersed and incorporated with it. And in breathing on gems, you may see that slight moisture is immediately dissolved, like a cloud scattered by the wind. Again, a piece of magnet does not attract so much iron as the whole magnet. On the other hand, there are virtues in which a small quantity has more power ; as in piercing, a sharp point penetrates more quickly than a blunt one ; a pointed diamond scratches glass, and the like.

But we must not stop here among indefinites, but must inquire what *Ratio* the *Quantity* of a body bears to the mode of its virtue. For it would be natural to believe that the one equalled the other ; so that if a leaden ball of one ounce weight fell in a given time, a ball weighing two ounces ought to fall twice as fast, which is most untrue. Nor do the same ratios hold in all kinds of virtues, but widely different ones ; and so those measures must be fought from the things themselves, and not from likelihood or conjectures.

Lastly, in all investigations of Nature the *quantity* of body required to produce any effect must be noted, and cautions as to excess or deficiency be interspersed.

xlvi. Among *Prerogative Instances* we shall put in the twenty-fourth place, *Instances of the Struggle*, which we also call *Predominating Instances*. They point out the way in which virtues predominate and give way in turns, and show which of them is the stronger and victorious, which the weaker and subdued. For the motions and efforts of bodies are composed, decomposed, and complicated, no less than the bodies themselves. We shall therefore set forth first the principal kinds of motions and active virtues, with a view to a more accurate comparison of them with regard to strength, and the consequent demonstration and designation of *Instances of the Struggle and Predominance*.

1. Let the first Motion be the *Motion of the Resistance of Matter* which subsists in each of its particles, by reason of which it will not be annihilated ; so that there is no degree of fire, of weight, or pressure, no violence, no age nor duration of time, which can reduce to nothing even the smallest portion of matter, and prevent it from being something, and occupying some space, and from liberating itself (no matter what restraint be put upon it) by changing either its form or its position ; or, if this be not allowed, from subsisting as it is ; nor can it ever come to the condition of being nothing, or nowhere. And this motion the Schoolmen (who almost always denominate and define things according to their effects and inconveniences rather than their inner causes) either denote by that Axiom, "Two bodies cannot be in one place," or call it a motion "to prevent the penetration of dimensions." And it is unnecessary to produce examples of this motion, for it is inherent in every body.

2. Let the second Motion be that which we call *Motion of Connection*, by which two bodies do not allow themselves to be separated at any point from some other body, as if they delighted in mutual connection and contact. This motion the Schoolmen call motion "to prevent a vacuum ;" as when water is drawn upwards by suction or by syringes ; the flesh by cupping-glasses : or when water stands in perforated jars, without running out, unless the mouth of the jar be opened to let in the air ; and numerous instances of this kind.

3. Let the third Motion be that of *Liberty* (as we call it), by which bodies endeavour to free themselves from unnatural pressure or tension, and to return to dimensions suitable to their body. Of this motion also there are countless examples ; as (of escape from pressure)

water, in swimming ; air, in flying ; water, in rowing ; air, in the undulation of winds ; the springs in clocks. And this motion of compressed air is shown prettily in children's toy guns, which they make by hollowing out a piece of elder or some such wood, and then stuff in a lump of some succulent root, or the like, at each end : they then thrust the pellet of root towards the other opening by means of a ramrod ; on which the piece is driven out and expelled at the other end with a report, and that before it is touched by the neighbouring root or pellet, or by the ramrod. And as to liberation from tension, this motion shows itself in the air which remains after the exhaustion of glass eggs ; and in strings, leather, cloth, which recoil after tension, unless it has become too strong by continuance, &c. And this motion the Schoolmen indicate under the name of Motion "from the Form of Element ;" unskilfully enough, as this motion pertains not only to air, water, or flame, but to all substances possessing consistency, however diverse : as wood, iron, lead, cloths, skins, &c., in which each body has its own measure of dimensions, and is with difficulty extended into any other appreciable space. But because this motion of liberty is the most obvious of all, and of infinite application, it would be wise to distinguish it well and clearly. For some very carelessly confound this motion with the two motions of resistance and connection ; that is to say, the liberation from pressure with the motion of resistance ; the liberation from tension with the motion of connection ; as if bodies, when compressed, yielded or expanded, to prevent a *penetration of dimensions* ; and bodies under tension recoiled and contracted to prevent the formation of a *vacuum*. But if air, when compressed, were to contract till it became dense as water, or wood till it became dense as stone, there would be no occasion for a *penetration of dimensions* ; and yet the compression would be far greater than they ever endure. In the same way, if water were to expand till it became as rare as air, or stone till it became rare as wood, there would be no need of a *vacuum*, and yet the degree of extension would be far greater than they ever endure. So the question does not become one of *penetration of dimensions*, or of a *vacuum*, except in the extreme limits of condensation and rarefaction ; while the motions of which we speak stop short far within these limits : and are nothing but the desire of bodies to preserve their consistency (or, if it be preferred, their Forms), and not to recede from them hastily, nor to be altered, save by gentle means and by their own consent. Now it is far more necessary for men to be told (inasmuch as it carries with it great results) that the violent motion (which we call mechanical, but which Democritus, who, in explaining his prime motions, must be set far below even middling philosophers, called *Motion of a Stroke*) is merely the *Motion of Liberty*, that is to say, from compression to relaxation. For in all simple protrusion or flight through air, there is no displacing or motion in space, before the parts of the body are unnaturally acted upon and compressed by the impelling force. Then each part pushing the other in succession, the whole is carried along, not only with a progressive, but also with a rotatory motion, the parts

seeking thus to free themselves, or else to bear the pressure in fairer proportions. And thus much of this kind of motion.

4. Let the fourth Motion be that to which we have given the name of the *Motion of Matter*, which is in some sort the converse of the motion just mentioned. For in the *Motion of Liberty* bodies dread, reject, and shun a new dimension, or a new sphere, or a new expansion and contraction (for all these different expressions intend the same thing), and strive, with all their might, to recoil and recover their former consistency. On the contrary, in this *Motion of Matter*, bodies desire a new sphere or dimension, and aspire to it readily and hastily, and sometimes with a very powerful effect (as in the case of gunpowder). Now the instruments of this motion, not the only ones, certainly, but the most powerful, or at least the most frequent, are heat and cold. For example: air, when expanded by tension (as in the case of glass eggs exhausted by suction) labours under a great desire of restoring itself. But if heat be applied, it longs, on the contrary, to expand, and desires a new sphere, and passes over and enters into it readily, as into a new Form (as they say); and after undergoing some expansion, does not care to return, unless it be invited thereto by the application of cold; and this is not a return, but a renewed transformation. In the same manner also water, if it be made to contract under pressure, resists, and wishes to become again as it was before, that is to say, larger. But if intense and protracted cold intervene, it condenses itself spontaneously and readily into ice: and if the cold be continued, and be not interrupted by a thaw (as is the case in deep caverns and grottoes), it turns into crystal or some similar material, and never returns to its former consistency.

5. Let the fifth Motion be the *Motion of Continuity*, by which term we do not intend simply a primary continuity with some other body (for that is the *Motion of Connection*), but self-continuity in a fixed body. For it is most certain that all bodies dread a solution of their continuity, some more, some less, but all up to a certain point. For while in hard bodies (as steel or glass) the resistance to a solution of continuity is extremely strong and powerful, liquids again, in which motion of that kind seems to cease or at least to be languid, are found to be not altogether destitute of it; it is really there, in its lowest degree of manifestation, and betrays itself in very many experiments; as in bubbles, in the roundness of drops, in the thin threads of drippings from roofs, in the tenacity of glutinous bodies, and the like. But most of all does this appetite display itself, if we attempt to extend the discontinuity to small fragments. For in a mortar, after a certain amount of pounding, the pestle produces no further effect; water does not penetrate into very small chinks; and even air itself, notwithstanding its corporeal subtlety, does not suddenly pass into the pores of solid vessels, until after a long-continued insinuation.

6. Let the sixth Motion be that which we call *Motion for Gain*, or *Motion of Want*. It is that by which bodies, when placed among other bodies quite heterogeneous and hostile, if they find no opportunity or means of escaping from them, and applying themselves to

others more cognate (though even these cognate bodies are such as have no close sympathy with them), nevertheless immediately embrace these latter, and choose them as preferable; and seem to set down this union as a *gain* (whence we borrow our term), as though they were in need of such bodies. For example: gold or any other metal, in the form of leaves, does not like the surrounding air. So if it meets with any thick and tangible substance (as a finger, paper, or anything else), it forthwith adheres to it, and is not eagerly torn off. Again, paper, cloth, and the like, do not agree well with the air which is inserted and mingled in their pores. So they easily imbibe water or other liquids, and drive out the air. Again, a piece of sugar, or a sponge soaked in water or wine, even though part of it is left standing out high above the wine or water, nevertheless draws the water or wine gradually upwards.

And hence may be drawn an excellent rule for opening and dissolving bodies. For, setting aside corrosive and strong waters, which open a way for themselves, if there can be found a body proportioned to and more in harmony and friendship with any solid body than that with which it is at present perforce connected, that body forthwith opens and relaxes itself, and receives the new one into itself, to the exclusion or removal of the former. Nor does this *Motion for Gain* operate, or is it possible only, when the bodies are in contact. For electricity (about which Gilbert and his followers have invented such fables), is nothing but a corporeal desire created by a gentle friction, which does not well endure the air, but prefers something tangible, if it be found in its neighbourhood.

7. Let the seventh Motion be that which we call *Motion of Greater Congregation*, by which bodies are carried to masses of a like nature with themselves; the heavy to the earth, the light to the circumference of the sky. This the School has denoted by the name of Natural Motion, having looked into the matter but slightly; either because there was no external motion discernible to produce the motion (wherefore they thought it to be innate and inherent in things themselves), or, maybe, because it never ceases. And no wonder: for heaven and earth are always present, whereas the causes and origins of most other motions are sometimes absent and sometimes present. Therefore, this motion, because it is never intermittent, but always makes its appearance when others are intermitted, they call perpetual and proper; all others they set down as adscititious. This motion, however, is in reality sufficiently weak and dull, inasmuch as it is one which (except in bodies of considerable size) yields and succumbs to all other motions, so long as they are in operation. And though this motion has so occupied men's thoughts as almost to throw others in the background, yet they know but little about it, and are involved in many errors concerning it.

8. Let the eighth Motion be the *Motion of Lesser Congregation*, by which the homogeneous parts in any body separate themselves from the heterogeneous, and combine among themselves: by which also entire bodies, from similarity of substance, embrace and cherish each

other, and sometimes are collected and attracted together from some distance ; as when in milk, after standing some time, the cream rises and swims on the top ; while in wine the dregs and tartar fall to the bottom. Nor is this owing to the *Motion of Heaviness and Lightness* alone, causing some particles to rise to the top, and others to sink to the bottom ; but in a much greater degree to the desire felt by homogeneous bodies to combine and unite among themselves. And this motion differs from the *Motion of Want* in two particulars. One is that in the *Motion of Want* there is at work the stronger stimulus of a malignant and contrary Nature ; whereas in this motion (provided there be nothing to hinder or coerce it) the particles unite from friendship, although there be no foreign Nature present to stir up strife. The other is, that the union here is closer, and in it greater choice is exercised. In the former, only let the hostile body be avoided, and bodies which are not very much akin will come together ; while in the latter, substances meet because they are connected by a distinct relationship, and are drawn together, as it were, into one. And this motion exists in all composite bodies, and would readily show itself in each of them, were it not tied and bound by other appetites and necessities in the bodies, which interfere with that union.

Now restraint is put upon this motion in three ways : by the torpor of bodies ; by the check of a discordant body ; and by external motion. With regard to the torpor of bodies, it is certain that there is in tangible bodies a certain sluggishness, more or less, and a dislike to motion in space ; so that, unless they be excited, they prefer remaining in their present condition to changing for the better. Now this torpor is shaken off by the help of three things : either by heat, or by the eminent virtue of some cognate body, or by a lively and powerful motion. And, as regards the aid of heat, it is for this reason that heat is designed to be—that *which separates what is heterogeneous and combines what is homogeneous* ; a definition of the Peripatetics which has been deservedly ridiculed by Gilbert, who says that it is much the same as if a man were to be defined as that which sows wheat, and plants vines—for that it is a definition by means of effects alone, and those particular ones. But the definition has something worse about it, since those effects (such as they are) are owing not to the peculiar properties of heat, but only to accident (for cold does the same, as we shall show hereafter), namely, to the desire of the homogeneous parts to unite ; heat helping only so far as to dispel the torpor which had previously fettered the desire. And as for help rendered by the virtue of a cognate body, it is marvellously well shown in the armed magnet, which excites in iron the virtue of detaining iron, by similarity of substance, the torpor of the iron being dispelled by the virtue of the magnet. And with reference to help rendered by motion, it is conspicuous in wooden arrows, which have also points of wood, for these penetrate deeper into wood than if they were tipped with iron, owing to the similarity of substance, the torpor of the wood being dispelled by the rapid motion ; and of these two experiments we have spoken also in the Aphorism on *Clandestine Instances*.

The binding of the *Motion of Lesser Congregation*, which is caused by the restraint of a dominant body, is conspicuous in the resolution of blood and urine by cold. For as long as these bodies are filled with the active spirit, which, as if master of the whole, orders and restrains the several parts, of whatsoever kind, so long the homogeneous parts do not meet together on account of the restraint; but as soon as the spirit has evaporated, or has become choked with cold, then the parts, freed from restraint, meet together according to their natural desire. And thus it happens that all bodies which contain an eager spirit (as salts and the like) remain without being dissolved; owing to the permanent and durable restraint of a dominant and imperious spirit.

The binding of the *Motion of Lesser Congregation*, which is caused by external motion, is most conspicuous in the shaking of bodies, to prevent putrefaction. For all putrefaction depends on the assembling together of homogeneous parts, whence there gradually takes place a corruption of the old Form (as they call it), and the generation of a new one. For putrefaction, which levels the way for the generation of a new Form, is preceded by the dissolution of the old, which is itself a meeting of homogeneous parts. And that, if not hindered, is simple reduction; but if it be met by various obstacles, there ensue putrefactions, which are the rudiments of a new generation; but if (as in the present case) a frequent agitation be kept up by external motion, then, indeed, this mode of uniting (which is delicate and tender, and requires rest from things without) is disturbed and ceases, as we see takes place in numberless cases; as when the daily stirring or flowing of water keeps off putrefaction; winds keep off pestilence in the air; corn turned and shaken in the granary remains pure: all things, in short, when agitated from without do not easily putrefy within.

It remains for us to notice that meeting of the parts of bodies which is the chief cause of induration and dessication. For when the spirit, or moisture turned to spirit, has escaped from some porous body (as wood, bone, parchment, and the like), then the grosser parts are drawn together, and unite with a greater effect; which we think arises not so much from the motion of *Connection*, to prevent a vacuum, as to this motion of friendship and union.

As for the meeting of bodies from a distance, that is unfrequent and rare; and yet it exists in more cases than are generally observed. We have examples of this when one bubble dissolves another; when drugs draw out humours, by similarity of substance; when the chord of one violin makes the chord of another sound an unison, and the like. We imagine, also, that this motion prevails in the spirits of animals, though it be altogether unperceived. But it certainly exists conspicuously in the magnet, and in excited iron. And when we speak of the motions of the magnet we ought carefully to distinguish them. For there are four virtues or operations in the magnet which should not be confounded, but kept apart; although the admiration and wonder of men have mixed them up together. The first is the

attraction of magnet to magnet, or of iron to the magnet, or of excited iron to iron. The second is its north and south polarity, and also its declination. The third, its power of penetrating through gold, glass, stone, in fact everything. The fourth, its power of communicating its virtue from stone to iron, and from iron to iron, without communication of substance. But in this place we are only speaking of the first virtue, viz., of combination. The motion of combination between quicksilver and gold is also remarkable, insomuch that gold attracts quicksilver, though made up into ointment; and men who work among the vapours of quicksilver usually keep a lump of gold in their mouths to collect the exhalations, which would otherwise penetrate their skulls and bones, by which the lump of gold is soon turned white. And thus much have we said concerning the *Motion of Lesser Congregation*.

9. Let the ninth Motion be *Magnetic Motion*, which, though it be in kind allied to the *Motion of Lesser Congregation*, yet if it operate at great distances, and on great masses, deserves a separate investigation; especially if it neither begins with contact, as most, nor leads to contact, as all motions of congregation do; but simply raises the bodies, or makes them swell, and nothing more. For if the moon raises the waters, or makes moist things swell; if the starry heaven attracts the planets towards their apogees; if the sun holds Venus and Mercury, so as to prevent their travelling further than a certain distance from him; these motions seem to be ranged properly neither under *Greater Congregation*, nor under *Lesser Congregation*, but to belong, as it were, to an intermediate and imperfect congregation, and therefore, by rights, to constitute a species of their own.

10. Let the tenth Motion be that of *Flight*: that is to say, a motion contrary to the *Motion of Lesser Congregation*, by which bodies, from antipathy, flee from and put to flight hostile bodies, and separate themselves from them, or refuse to mingle with them. For although in some cases the motion may seem to be accidental, or a consequence of the *Motion of Lesser Congregation*, because the homogeneous parts cannot come together until the heterogeneous parts have been excluded and removed; yet this motion should be set by itself, and be constituted a distinct species, because in many cases the desire of *Flight* is seen to be more powerful than the desire of coming together.

Now this motion is eminently conspicuous in the excretions of animals; and not less in objects odious to some of the senses, especially those of smell and taste. For a fetid odour is so rejected by the sense of smell, as even to induce a sympathetic motion of expulsion in the orifice of the stomach; a rough and bitter taste is so rejected by the palate or throat, as to induce a sympathetic shaking of the head, and shuddering. But this motion takes place in other things also. For it is conspicuous in certain Forms of *Antiperistasis*; as in the mid-region of the air, where the cold seems to be the result of the rejection of the Nature of cold from the confines of the heavenly bodies; as also the great heats and burnings, which are found in subterraneous places, seem to be the results of the rejection

tion of the Nature of heat from the inner parts of the earth. For heat and cold, in small quantities, destroy one another ; but if they be present in great masses, and, as it were, in regular armies, then, after a conflict, they remove and expel each other in turn. It is said, also, that cinnamon and sweet herbs retain their perfumes longer when placed near drains and foul-smelling places, on account of their refusing to come out and mingle with fetid smells. It is certain that quicksilver, which of itself would reunite in a mass, is prevented by human saliva, hog's-lard, turpentine, and the like, from combining its particles, owing to the want of sympathy of its parts with such bodies ; from which, when spread around them, they draw back, so that their *Flight* from these intervening bodies is more energetic than their desire of uniting with parts like themselves ; and this is called the *mortification* of quicksilver. Moreover, the fact that oil does not mix with water is not simply owing to the difference of weight, but to the want of sympathy between these fluids ; as may be seen from the fact that spirit of wine, though lighter than oil, yet mixes well with water. But most of all is the *Motion of Flight* conspicuous in nitre, and such like crude bodies, which abhor flame ; as in gunpowder, quicksilver, and gold. But the *Flight* of iron from one side of the magnet is well observed by Gilbert to be not a *Flight*, properly so called, but a conformity, and a meeting in a more convenient position.

11. Let the eleventh Motion be that of *Assimilation*, or of *Self-Multiplication*, or of *Simple Generation*. By *Simple Generation* we do not intend that of integral bodies, as plants or animals, but of bodies of similar texture. We mean that by this motion bodies of similar texture convert other bodies of a kindred nature, or which are, at least, well disposed and prepared for them, into their own substance and Nature. Thus flame, over vapours and oily substances, generates new flame ; air, over water and watery substances, multiplies itself, and generates new air ; spirit, vegetable and animal, over the rarer particles both of water and oil, in its food multiplies itself, and generates new spirit ; the solid parts of plants and animals, as leaves, flowers, flesh, bone, and the rest, severally, out of the juices of their food assimilate and generate a successive and ever-renewed substance. For let no one adopt the wild fancy of Paracelsus, who (forsooth, blinded by his fondness for distillations) would have that nutrition took place by separation alone ; and that in bread and meat lie concealed eye, nose, brain, liver ; in the moisture of the earth, root, leaves, and flowers. For as the artisan out of the rude mass of stone or wood, by separation and rejection of what is superfluous, brings forth leaf, flower, eye, nose, head, foot, and the like ; so, he asserts, Archæus, the internal artisan, educes out of food, by separation and rejection, the several members and parts of our body. But leaving these trifles, it is most certain that the several parts, as well similar as organic, in vegetables and animals, do first attract, with some degree of choice, the juices of their food which are alike, or nearly so for all, and then assimilate them, and convert them into their own Nature. Nor does this *Assimilation*, or *Simple Genera-*

tion, take place solely in animate bodies ; inanimate bodies also share in it, as has been said of flame and air. Moreover the dead spirit, which is contained in every tangible animate substance, is perpetually at work digesting the coarser parts, and changing them into spirit, to be afterwards expelled ; whence arises the diminution of weight, and the dessication, which we have mentioned elsewhere. Nor, in considering *Assimilation*, must we reject that accretion which is commonly distinguished from alimentation, as when clay between stones hardens, and is converted into stony matter ; when the scaly substance on the teeth turns into a substance no less hard than are the teeth themselves, &c. For we are of opinion that there exists in all bodies a desire for *Assimilation*, as well as for combining with homogeneous substances ; but this virtue is restrained, as is the former, though not by the same means. But these means, as well as the method of escape from them, should be investigated with all diligence, because they bear upon the rekindling of old age. Lastly, it seems worthy of note, that, in the nine motions already spoken of, bodies seem only to desire the preservation of their own Nature ; but in this tenth the propagation of it.

12. Let the twelfth Motion be that of *Excitation* ; a motion which seems to belong to the same genus as that of *Assimilation*, and which we sometimes call indiscriminately by that name. For it is a motion diffusive, communicative, transitive, and multiplicative, as is the other ; and agreeing with it, for the most part, in effect, but differing in the mode of effect, and the subject-matter. The *Motion of Assimilation* proceeds, as it were, with authority and power, for it commands and compels the assimilated body to be turned into the assimilating. But the *Motion of Excitation* proceeds, as it were, with art, by insinuation, and stealthily, and only invites and disposes the excited body towards the Nature of the exciting. Moreover, the *Motion of Assimilation* multiplies and transforms bodies and substances ; thus more flame is produced, more air, more spirit, more flesh. But in the *Motion of Excitation* virtues only are multiplied and transferred ; more heat being engendered, more magnetic action, more putrefaction. This motion is especially conspicuous in heat and cold. For heat does not diffuse itself in heating a body by communication of heat in the first instance, but only by *exciting* the parts of the body to that motion which is the Form of Heat, about which we have spoken in the *First Vintage concerning the Nature of Heat*. Therefore heat is excited far more slowly, and with far greater difficulty, in stone or metal, than in air, on account of the unfitness and unreadiness of those bodies for that motion ; so that it is probable that in the interior of the earth there may exist materials which altogether reject heat, because, through their greater condensation, they are destitute of that spirit with which the *Motion of Excitation* generally begins. In like manner the magnet endues iron with a new disposition of parts, and a conformable motion, and loses nothing of its own virtue. In like manner leaven, yeast, curd, and some poisons, excite and invite a successive and continual motion in dough, beer, cheese, or the human

body respectively ; not so much by the force of the exciting, as from the predisposition and easy yielding of the excited body.

13. Let the thirteenth Motion be the *Motion of Impression*, which is also of the same genus with the *Motion of Assimilation*, and is the most subtle of all diffusive motions. But we have thought fit to constitute it into a species by itself, on account of the remarkable difference between it and the two former. For the simple *Motion of Assimilation* transforms the bodies themselves ; so that if you take away the first moving agent, there will be no difference in what follows. For the first kindling into flame, or the first turning into air, has no effect on the flame or air of the next generation. In like manner the *Motion of Excitation* remains when the first mover is removed for a considerable length of time, as in a heated body when the first heat has been removed ; in excited iron when the magnet is removed ; in dough when the leaven is removed. But the *Motion of Impression*, although it is diffusive and transitive, yet seems ever to depend on the prime mover, so as, on its removal or cessation, immediately to fail and perish ; and therefore the result is arrived at in a moment, or, at least, in a short space of time. Wherefore we usually call the Motions of Assimilation and Excitation, *Motion of the Generation of Jupiter*, because the generation remains ; and the latter motion we call the *Motion of the Generation of Saturn*, because the birth is immediately devoured and absorbed. This motion manifests itself in three ways : in the rays of light ; in the percussion of sounds ; and in magnetic action, as far as communication is concerned. For, if light be removed, colours and its other images immediately vanish ; if the first percussion and the consequent agitation of the body be done away with, the sound soon after dies away. For though sounds are disturbed during their course by winds, as if by waves, yet we must be careful to remark that the sound does not last all the time that the resonance is going on. For when a bell is struck the sound seems to continue for a considerable time, whence one might easily fall into the error of thinking that during the whole of that time the sound is, as it were, floating and hanging in the air, which is most untrue. For the resonance is not numerically the same sound, but a renewal of it ; and this is shown clearly by quieting or restraining the percussion of the body. For if the bell be held tight, so that it cannot move, the sound immediately dies away, and resounds no longer ; as in stringed instruments, if after the first percussion the string be touched with the finger, as in the lyre ; or with a reed, as in the spinet ; the resonance immediately ceases. And when the magnet is removed the iron straightway falls. The moon cannot be removed from the sea, nor the earth from a falling body possessed of weight : and therefore we cannot make any experiments concerning them ; but the principle is the same.

14. Let the fourteenth Motion be the *Motion of Configuration, or Position*, by which bodies seem to desire not combination, or separation of any kind, but position, collocation, and configuration, with respect to others. And this motion is a very abstruse one, and has

not been well investigated. In some cases it seems to be referable to no cause ; but this, as we think, is not really the case. For if we inquire why the heavens revolve from east to west, rather than from west to east, or why they turn on poles placed near the Bears, rather than round Orion, or any other part of the heavens, such a question seems to be a sort of rhapsody, since these things ought rather to be received on the authority of experience, as positive truths. There are, indeed, in Nature some things which are ultimate, and referable to no cause ; but this does not seem to be one of them, being caused, in our opinion, by a certain harmony and consent of the universe, which has hitherto escaped observation. And if we admit the motion of the earth from west to east, the same questions remain. For it also moves on certain poles. And why, it may be asked, should these poles be placed where they are, rather than anywhere else ? Again, the polarity, the direction, and declination of the magnet are referable to this motion. There are also found in bodies both natural and artificial, especially such as possess consistency, and are not fluid, a certain collocation and position of parts, and a kind of threads and fibres, which ought to be carefully investigated ; for until their Nature is discovered, these bodies cannot be conveniently handled or governed. But those eddyings in fluids by which, when pressed, before they can free themselves, they relieve each other, that the compression may be more evenly distributed, are more correctly assigned to the *Motion of Liberty*.

15. Let the fifteenth Motion be the *Motion of Pertransition*, or *Motion according to the Passages*, by which the virtues of bodies are more or less impeded or promoted by their media, according to the Nature of the bodies and of the virtues operating on them, and also of the medium. For one medium suits light, another sound, another heat and cold, another magnetic virtues, and so on with others.

16. Let the sixteenth Motion be that which we call *Regal*, or *Political*, by which the predominant and commanding parts in any body restrain, tame, subdue, and arrange the rest, and compel them to unite, separate, stand still, be moved, be placed, not according to their own inclinations, but in such order as may conduce to the well-being of that commanding part ; so that there is a sort of rule or polity exercised by the ruling part over those which are subordinate. This motion is most especially observable in the spirits of animals, where, as long as it is in vigour, it controls the motions of all the other parts. It is also found in other animals in an inferior degree, as has been said of blood and urine, which are not dissolved until the spirit, which has been mingling and restraining their parts, is expelled or stifled. Nor is this motion peculiar to spirits alone, although in many bodies the spirits predominate, owing to the swiftness of their motion and penetration. But in bodies of greater condensation, which are not filled with a lively and energetic spirit (such as exists in quicksilver and vitriol), the thicker parts predominate, so that, unless some art is used to shake off this rein and yoke, there is no hope of any new transformation in bodies of this kind. But let no one suppose that

we are forgetting the subject under consideration, because while this series and distribution of motions tends to nothing but the better investigation of their *predominance* by *Instances of Strife*, we now make mention of predominance among the motions themselves. For in describing this *Regal Motion* we do not treat of the *predominance* of motions or virtues, but of the *predominance* of parts in bodies. For this is the *predominance* which constitutes that peculiar species of motion of which we speak.

17. Let the seventeenth Motion be the *Spontaneous Motion of Rotation*, by which bodies delighting in motion, and advantageously placed, enjoy their Nature, and follow themselves alone, and, as it were, court their own embraces. For it seems that bodies either have motion without limit, or remain entirely at rest, or tend to a limit at which, according to their own Nature, they either revolve or remain at rest. Those which are favourably placed, if they delight in motion, move in circles, with a motion that is eternal and infinite. Those which are favourably placed, and hate motion, rest. Those which are not favourably placed, move in a straight line (as the shortest path), to consort with kindred bodies. But this *Motion of Rotation* admits of nine differences. The first has reference to the centre round which the bodies move; the second, to the poles on which they move; the third, to the circumference or orbit, according to their distance from the centre; the fourth, to their velocity, according to the greater or less rapidity of their rotation; the fifth, to the course of their motion as from east to west, or from west to east; the sixth, to their declination from a perfect circle, by spirals more or less distant from their centre; the seventh, to their declination from a perfect circle by means of spirals more or less distant from their poles; the eighth, to the greater or less distance of their spirals from each other; the ninth and last, to the variation of the poles themselves, if they are moveable; which, however, has nothing to do with rotation, unless it be circular. And this motion is held by common and long-received opinion to be the proper motion of heavenly bodies. There is, however, a grave controversy about this motion among some, both of the ancients and moderns, who have attributed *rotation* to the earth. But perhaps a far juster question suggests itself, supposing the case not to be past all question, viz., whether this motion (granting that the earth is stationary) is confined to the heavens, or does not rather descend, and impart itself to the air and water. The *Motion of Rotation* in missiles, such as darts, arrows, bullets, and the like, we refer to the *Motion of Liberty*.

18. Let the eighteenth Motion be the *Motion of Trepidation*, in which (as understood by astronomers) we do not put much faith. But the motion comes before us during a careful scrutiny of the appetites of natural bodies, and ought, as it seems, to be made to constitute a species. It is a Motion of what may be called eternal captivity. It occurs, for instance, when bodies which are in a position not in every respect suitable to their Nature, and yet are not altogether uneasy, are in a continual state of trepidation, and move restlessly,

being discontented with their present position, and yet not daring to proceed further. Such is the motion found in the heart and pulses of animals, and must of necessity occur in all bodies which exist in an intermediate state between comfort and discomfort, so that when disturbed they try to liberate themselves, and being again repulsed, are yet for ever trying again.

19. Let the nineteenth and last Motion be that which, while it hardly suits to the name, is yet plainly a motion. And this we may call the *Motion of Repose*, or of *Aversion to Motion*. By this Motion the earth stands still in its mass, while its extremities are moving to the middle; not to an imaginary centre, but to a point of union. By this appetite also all bodies of great density dislike motion; in fact, they have no other desire than that not to be moved; and although they be tempted and provoked to motion in numberless ways, yet, as far as possible, they preserve their own Nature. And if they be compelled to motion, they still always seem to be striving to recover their state of rest, and to move no more. And in doing so they certainly show themselves nimble, and strive for it eagerly and swiftly enough, as if weary and impatient of any delay. Of this appetite only a partial representation can be seen, since, here with us, from the subduing and concocting influence of the heavenly bodies, everything tangible is not only condensed to the last degree, but is even mixed with some spirit.

And so we have now set forth the species, or simple elements of motions, or appetites, and active virtues, which are in Nature most universal. And no small extent of Natural Science is sketched forth in connection with them. Nevertheless we do not pretend that other species may not be added; or that these same divisions may not be laid down differently, and more in conformity with the truer veins of Nature; or that they may not be reduced to a smaller number. And we do not intend what we have been saying to refer to any abstract distinction, as if one were to say that bodies desire either the conservation, or exaltation, or propagation, or fruition of their Nature; or that the motions of things tend to the conservation and advantage either of the Universe, as *Resistance* and *Connection*; or of great wholes, as the *Motions of Greater Congregation, Rotation, and Dreaa of Motion*; or of Special Forms, and the rest. For though these may be true, yet, unless they be defined in matter and fabric in accordance with true lines, they are speculative and of little use. Meanwhile these will suffice, and be of good service in weighing the *Predominances of Virtues*, and seeking out *Instances of Strife*, which is our business at present.

For of the Motions which we have set forth, some are quite invincible; some are stronger than others, and fetter, curb, and order them; some reach farther than others; some outstrip others in time and speed; some cherish, strengthen, enlarge, accelerate them.

The *Motion of Resistance* is completely adamant and invincible. Whether that of *Connection* is so also we are yet in doubt, for we cannot affirm for certain whether there be a vacuum, either gathered

together in one place, or dispersed through the pores of bodies. But of this we are sure, that the reason which induced Leucippus and Democritus to introduce the doctrine of a vacuum (viz. that without it the same bodies could not embrace and fill spaces of different magnitudes) is a false one. For there is clearly a *Folding of Matter*, which folds and unfolds itself in space, within certain limits, without the interposition of a vacuum; nor is there in air two thousand times the amount of vacuum (as there ought to be according to theory) that there is in gold. This is sufficiently clear from the very powerful virtues of pneumatic bodies (which would otherwise float like small dust in vacuum), and by many other proofs. The other kinds of motion govern and are governed in turn, each according to the vigour, quantity, velocity, and force of propulsion, and also to the aids and hindrances, which it meets with.

For example: some armed magnets hold and suspend iron sixty times their own weight. So far does the *Motion of Lesser Congregation* predominate over that of *Greater Congregation*: if the weight be greater, it gives way. A lever of a certain strength will lift a certain weight; so far does the *Motion of Liberty* predominate over that of *Greater Congregation*; but if the weight be increased it gives way. Leather stretched up to a certain degree of tension does not break; so far does the *Motion of Continuity* predominate over the *Motion of Tension*; but if the tension be carried further, the leather is broken, and the *Motion of Continuity* gives way. Water runs out through a hole of a certain bore; so far the *Motion of Greater Congregation* predominates over the *Motion of Continuity*: but, if the size of the hole be lessened, it gives way, and the *Motion of Continuity* conquers. If powdered sulphur be put by itself into a mortar with a ball, and fire be applied, the ball is not expelled; in this case the *Motion of Greater Congregation* overcomes the *Motion of Matter*. But if gunpowder be put in, the *Motion of Matter* in the sulphur is victorious, being aided by the *Motions of Matter* and *Flight* in the nitre; and so of the rest. For the *Instances of the Struggle* (which mark *Predominance of Virtues*, together with the method and proportion in which they predominate and give way) must be sought from all quarters with keen and unremitting diligence.

Further, the manner and proportion in which these motions give way must be diligently examined. That is to say, whether they stop altogether, or whether they continue to resist under restraint. For in bodies here with us there is no real rest, either in wholes, or in parts, but only in appearance. Now this apparent rest is caused either by *Equilibrium*, or by absolute *Predominance of Motions*. By *Equilibrium*, as in scales, which are stationary if the weights be equal; by *Predominance*, as in perforated vessels containing water, where the water remains at rest, and is kept from falling out by the *Predominance* of the *Motion of Connection*. But it should be observed, as we have said, how far these motions resist before giving way. For if a man be kept perforce extended on the ground, with his arms and legs bound, or be otherwise held down, and yet strive with all his might to

rise, the effort is not the less, though it be unsuccessful. But the real state of the matter (that is to say, whether by *Predominance* the motion which gives way is, as it were, annihilated, or whether the effect is continued, although so as not to be visible) will perhaps, though latent in the conflict, become apparent in the concurrence of motions. For example, let experiment be made in musketry, observing how far a gun will carry a ball in a straight line, or, to use the common expression, point blank; and try whether, if it be fired upward (in which case the motion of the blow is simple), the stroke be feebler than when it is fired downward, where the *Motion of Gravity* acts in the same direction with the blow.

Again, such canons of *Predominances* as we meet with must be collected. As, that the more general the advantage sought, the stronger is the motion; thus the *Motion of Connection*, which has respect to communion with the Universe, is stronger than the *Motion of Gravity*, which has respect to communion with dense bodies. Also, appetites which seek private good seldom prevail against appetites which seek a more public good, except in small quantities. Would that the same rules held good in politics!

xlix. Among *Prerogative Instances* we shall put in the twenty-fifth place, *Suggestive Instances*: those which suggest or indicate what is useful to men. For mere power and mere knowledge enlarge human Nature, but do not bless it. Therefore we must gather from the whole mass of things such as contribute most to the uses of life. But a more proper place for speaking of these will be when we come to treat of *Deductions to Practice*. Moreover, in the work itself of *Interpretation* on each individual subject, we always assign a place to the *Human Chart*, or *Chart of Things to be desired*. For to wish judiciously is as much a part of knowledge as to inquire judiciously.

l. Among *Prerogative Instances* we shall put in the twenty-sixth place, *Polychrest Instances*, or *Motions of Manifold Use*. They are such as have various applications, and are of frequent occurrence, and therefore save no small amount of labour and fresh demonstration. But of the instruments and contrivances themselves the proper place for speaking will be when we come to treat of *Deduction to Practice*, and *Modes of Experimenting*. Moreover, those which are already known, and have come into use, will be described in the particular histories of the individual arts. At present we shall subjoin a few general remarks on them merely to illustrate this *Manifold Use*.

Man, then, acts upon bodies (over and above their simple application and withdrawal) chiefly in seven ways: either by exclusion of whatever hinders and disturbs; by compression, extension, agitation, and the like; by heat and cold; by continuance in a suitable place; by the restraint and government of motion; by special sympathies; or by the seasonable and due alternation, series, and succession of all these methods, or at least of some of them.

With regard to the first; the common air, which surrounds us on all sides, and presses in upon us, and the rays of the heavenly bodies, cause much disturbance. Therefore whatever tends to exclude them

deserves to be reckoned among things of *Manifest Use*. To this division belongs the substance and thickness of vessels in which bodies prepared for operating upon are laid up. Such, too, are the contrivances for hermetically sealing vessels, by consolidation, and the *Lutum sapientie*, as chemists call it. Again, the closing up of substances by pouring liquids on their outsides is a most useful practice, as when they pour oil over wine, or the juice of herbs, which, by expanding over the surface like a cover, admirably preserves them from the air. Nor are powders a bad thing ; for these, although they contain some air mixed up with them, yet repel the force of the body of air which surrounds them, as is the case when grapes or other fruits are preserved in sand or flour. Again, wax, honey, pitch, and bodies of like tenacity, are rightly used to make exclusion more perfect, and to keep off the air and the heavenly influences. We have, too, sometimes made the experiment of placing a vessel, and some other bodies as well, in quicksilver, by far the most dense substance by which bodies can be surrounded. Moreover, grottoes and subterranean caverns are of great use in preventing the action of sunlight, and of that open air which is so destructive ; and such places are used by the inhabitants of North Germany as granaries. The placing of bodies in water has the same effect ; as I remember to have heard of bottles of wine sunk in a deep well, for the purpose of cooling them, and afterwards accidentally or carelessly forgotten, and allowed to remain there for many years : when they were at last taken out, the wine was found not only to be not vapid and lifeless, but to taste far better than before, owing, as it seems, to the more exquisite mixture of its parts. If the case requires that the bodies should be let down to the bottom of the water, as in a river, or the sea, without either touching the water, or being inclosed in sealed vessels, but simply surrounded with air ; that vessel may well be used which is sometimes employed in operations under water upon sunken ships, and by the aid of which divers can remain a long time under water, and breathe occasionally by turns. This instrument was constructed as follows. A hollow bell of metal was let down parallel to the surface of the water, so as to carry with it to the bottom of the sea all the air which it contained. It stood on three feet (like a tripod), the height of which was somewhat less than that of a man, so that the diver, when out of breath, could put his head into the bell, take a breath, and then continue his work. And we have heard that a sort of boat or vessel has been invented capable of carrying men under water for some distance. Any bodies, therefore, can easily be hung up in such a vessel ; which is our reason for mentioning this experiment.

There is also another advantage in carefully and completely closing up bodies ; for not only does it prevent the access of external air (of which we have just spoken), but it also restrains the exit of the spirit of the body, on which it is being operated on inside. For it is necessary that he who acts on natural bodies should be certain about their total quantities, viz., that nothing has evaporated or flowed out. For profound alterations take place in bodies when, while Nature prevents

annihilation, Art prevents also the loss or escape of any part. On this subject there has prevailed a false opinion, which, if true, would well nigh render desperate our chance of preserving a fixed quantity without diminution, viz., that spirits of bodies, and air when rarefied by a high degree of heat, cannot be contained in closed vessels, but escape through their more delicate pores. To this opinion men have been led by the common experiment of a cup inverted over water, with a candle or a piece of paper lighted inside it ; the consequence of which is that the water is drawn up : and by the familar experiment of cupping-glasses, which, when heated over flame, draw up the flesh. For they think that in each of these experiments the rarefied air escapes, and that its quantity being thereby diminished, the water or flesh takes its place by *Motion of Connection*. But this is most erroneous. For the air is not diminished in quantity, but contracted in space ; nor does the motion of the rising of the water begin till the flame is extinguished, or the air cooled ; so that physicians, to make their cupping-glasses draw better, place upon them cold sponges moistened with water. Therefore there is no reason why men should be much afraid of the easy escape of air or spirits. For though it be true that even the most solid bodies have pores, still air or spirit with difficulty endures such excessive subdivision ; just as water refuses to run out at very small chinks.

2. Concerning the second of the seven above-mentioned modes of operating, we must especially observe, that compression and such violent means have indeed a most powerful effect with respect to local motion and the like, as in machines and projectiles, even to the destruction of organic bodies, and of such virtues as consist entirely in motion. For all life, nay, even all flame and ignition, is destroyed by compression, just as every machine is spoiled and thrown into confusion by the same. It also leads to the destruction of those virtues which consist in the position and the grosser dissimilarity of the parts. This is the case with colours : for the whole flower has not the same colour as when it is bruised ; nor the whole piece of amber as the same piece pulverized. So also it is with tastes (for there is not the same taste in an unripe pear as there is in a pressed and ripened one, for the latter is decidedly sweeter). But this kind of violence has not much effect on the more noble transformations and alterations of similar bodies, because bodies do not acquire by them any new constant and quiescent consistency, but only one which is transitory, and struggles always to restore and liberate itself. But it would not be out of our way to make some rather careful experiments on this matter : to see, that is, whether the condensation or rarefaction of some very similar body (such as air, water, oil, and the like), being induced by violence, can be made to be constant and free, and to become a sort of Nature. Experiment should first be made by simple continuance, and afterwards by means of aids and sympathies. And this experiment might have readily been made (if only it had occurred to us) when we were condensing water (as mentioned elsewhere) by means of hammering and compression, before it broke loose. For

we should have left the flattened sphere to itself for several days, and then taken out the water ; and so tried whether it would immediately occupy the same dimensions as it did before condensation. If it did not do so, either immediately, or, at any rate, soon after, we might set down the condensation as constant ; if not, it would have appeared that the restitution had taken place, and that the compression was transitory. And something similar might have been done with reference to the extension of air in the glass eggs. For we should, after strong suction, have closed the aperture quickly and closely, and have allowed the eggs to remain so closed for some days ; and then we might have tried whether, when the hole was opened, the air would have been drawn in with a hissing sound ; or whether, if they were plunged in water, as much water was drawn up as there would have been at first before the delay. For it is probable, or at least worthy of trial, that this might have been, and may be the result ; since in bodies which are not quite so uniform a lapse of time does produce such effects. For a stick bent by compression after a time does not recoil ; and this must not be imputed to any loss of quantity in the wood, for the same is the case with plates of iron, if the time be increased ; and iron does not evaporate. But if the experiment does not succeed by mere continuance, the matter must not be given up, but other aids must be employed. For it is no small gain if, by using force, we can implant in bodies fixed and constant Natures. For by this means air can be condensed into water ; and many other results of the kind be produced ; for man is more master of violent motions than of any others.

3. The third of the seven modes relates to that which is the great instrument of operation, whether in Nature or in Art, viz., Heat and Cold. And herein man's power clearly halts on one foot. For we have the heat of fire, which is infinitely more potent and intense than the heat of the sun as it reaches us, and the heat of animals. But we have no cold save such as is to be found in the winter, or in caverns, or by the application of snow and ice ; which may correspond, perhaps, to the heat of the sun at noon in the torrid zone, increased by the reflection of mountains and walls ; for to such an extent both heat and cold can be borne for a short time by animals. But they are nothing in comparison with the heat of a burning furnace, or with any cold corresponding to it in degree. Thus all things here with us tend to rarefaction, desiccation, and consumption ; and hardly anything to condensation and inteneration, except by mixtures and methods which are, so to speak, spurious. Wherefore Instances of Cold must be collected with all diligence ; and such, we think, may be found by exposing bodies on towers during sharp frosts ; by laying them in subterranean caverns ; by surrounding them with snow and ice in deep pits dug on purpose ; by letting them down into wells ; by burying them in quicksilver and metals ; by immersing them in waters which turn wood into stone ; by burying them in the earth as the Chinese are said to do with porcelain, who are said to leave masses, made for the purpose, under ground for forty or fifty years, and to

transmit them to their heirs as a sort of artificial minerals ; and by similar methods. Moreover, all natural condensations brought about by cold should be investigated, with a view to employing them in the arts when their causes are known. Such may be seen in the exudations from marble and stones ; in the dews found on the inside of windows in the morning after a frosty night ; in the formation and collection of vapours into water under the earth, whence fountains often spring up ; and everything of the kind.

But besides things which are cold to the touch, there are found certain others having the power of cold, which also condense, but which seem to act on the bodies of animals only, and hardly to go any further. Of this sort medicines and plasters present us with many examples, some of which condense the flesh and tangible parts, as astringent and also inspissated drugs ; while others condense the spirits, as is especially seen in the case of soporifics. Now there are two ways in which drugs of a soporific or sleep-producing character condense the spirits : the one by quieting their motions, the other by putting them to flight. For the violet, dried roses, lettuce, and the like beneficent or benignant medicines, by their friendly and gently cooling fumes, invite the spirits to unite with them, and restrain their eager and restless motion. Again, rose-water, when applied to the nostrils of a person who has fainted, causes the resolved and too relaxed spirits to recover themselves, and in a manner cherishes them. But opiates and their allies put the spirits entirely to flight, from their malignant and hostile character. And so, if they be applied to an external part, the spirits immediately take flight from that part, and are no longer willing to flow into it ; but if they be taken internally, their vapours, ascending to the head, put to flight on all sides the spirits contained in the ventricles of the brain ; and when the spirits retract themselves, being unable to flee into any other part, they are in consequence brought together and condensed, and sometimes quite extinguished and suffocated ; though, on the other hand, these same opiates, taken in moderation, do, by a secondary accident and quality (viz., that condensation which succeeds upon their coming together), comfort the spirits, make them stronger, and check their useless and inflammatory motions ; whence they come to contribute in no small degree to the cure of diseases, and the prolongation of life.

Again, we must not neglect the preparing of bodies to receive cold ; for instance, water slightly warmed is more easily frozen than when quite cold ; and the like.

Besides, since Nature supplies cold so sparingly, we must do as the apothecaries do, who, when a simple is not to be obtained, take its substitute, or *quid pro quo*, as they call it : as lign aloes for balsam, caffia for cinnamon. In like manner we must look round diligently to see if there be any substitutes for cold, viz., any means by which condensations can be brought about in bodies otherwise than by cold, whose proper office it is to effect them. Now the number of these condensations seems to be limited to four, as far as is yet seen. Of these the first appears to be brought about by simple compression, which

can do but little towards producing constant density, (since bodies recoil,) but which may yet, perhaps, be of use as an auxiliary. The second is brought about by contraction of the grosser parts in any body after the evaporation or escape of the finer, as happens in hardening by fire, in the repeated quenchings of metals, and the like. The third is brought about by the coming together in any body of the homogeneous parts, which are most solid, and which were before dispersed, and mixed up with those that are less solid ; as in the restoration of sublimed mercury, which, in a state of powder, occupies a far greater space than as simple mercury ; and similarly in every purification of metals from their dross. The fourth is brought about by sympathy, by applying substances which condense by some hidden power of their own : a sympathy which has as yet shown itself but seldom ; which is not to be wondered at, since, before we succeed in discovering Forms and Structures, we cannot hope much from inquiry into sympathies. As regards the bodies of animals, certainly there is no doubt that there are many media, of internal as well as external application, which condense, as it were, by sympathy, as we have said a little above. But with inanimate substances any operation of this kind is rare. There is prevalent, indeed, both in books and in common talk, a report of a tree in one of the Tercery or Canary Islands (I do not exactly remember which) which is continually dropping, so as to supply the inhabitants with a certain quantity of water. And Paracelsus says that the herb called Sundew is at noon, and in a burning sun, filled with dew, while all the other herbs round it are dry. But we think both of these accounts fabulous. If they were true, these instances would be most valuable, and worthy of examination. Nor do we think that those honeydews, like manna, which are found on the leaves of the oak in May, are formed and condensed by any sympathy or peculiar property in the leaves of the oak ; but that while they fall equally on the leaves of other trees, they are retained and remain on those of the oak, because these are compact, and not spongy, as most other leaves are.

Of heat, man has indeed abundant store at his command ; but observation and inquiry are wanting on some points, and those the most necessary, however the alchemists may boast. For the results of intense heat are sought out and reviewed ; but those of a gentler kind, which fall in most with the ways of Nature, are not explored, and are therefore unknown. And therefore we see that by those heats which are most used, the spirits of bodies are greatly exalted, as in the case of strong waters and some other chemical oils ; the tangible parts are indurated, and, the volatile being discharged, sometimes fixed ; the homogeneous parts are separated, and heterogeneous bodies are in a coarse way incorporated and mixed up ; above all, the connections of corporate bodies and their more subtle structures are broken down and thrown into confusion. Whereas the operations of a gentler heat ought to have been tried and investigated, whence the more subtle mixtures and regular configurations might be generated and educed, after the example of Nature, and in imitation of the

operation of the sun ; as we have sketched out in the Aphorism on the *Instances of Alliance*. For the operations of Nature are performed by far smaller portions at a time, and by arrangements far more exquisite and varied than the operations of fire as now applied. Then, indeed, may we expect to see a real increase in the power of man, when, by artificial heats and other influences, the operations of Nature can be represented in form, perfected in virtue, varied in abundance, and also accelerated in time. For the rust of iron takes a long time to form, but the turning into *crocus martis* takes place directly ; and the same is the case with *viridigris* and white lead ; again, crystal is a long time in forming, glass is blown immediately. Stones are long in growing, bricks are baked at once, &c. Meanwhile (and this is our business at present) heats of every kind, with their affections, must be carefully and industriously collected and investigated in all quarters ; the heat of the heavenly bodies by their rays direct, reflected, refracted, and combined in burning lenses ; the heat of lightning, flame, and coal fire ; of fire from different materials ; of fire opened, confined, straitened, and overflowing, in a word, as qualified by furnaces of different constructions ; of fire excited by the blast, and also quiescent and non-excited ; of fire removed to a greater or less distance ; of fire passing through different media ; of moist heats, as that of the water-bath, of dung, of animal heat external and internal, of confined hay ; of dry heats, as of ashes, lime, warm sand ; in short, heats of all kinds with their degrees.

But especially we must try to investigate and discover the effects and operations of heat, which approaches and retires gradually, orderly, and periodically, by due intervals both of space and time. For this orderly inequality is in truth the daughter of the heavens and mother of generation : nor is any great result to be expected from heat that is either vehement, precipitate, or that comes by fits and starts. And this is most manifest in vegetables. And also in the wombs of animals there is a great inequality of heat, arising from the motion, sleep, nourishment, and passions of the pregnant females : lastly, in the wombs of the earth itself, those, we mean, in which metals and fossils are found, this inequality has place and force. And this renders more remarkable the unskilfulness of some of the alchemists of the reformed school, who have thought that they can effect the wished-for result by employing the equable heats of lamps, and the like, burning uniformly. And thus much concerning the effects of heat. It would be unseasonable to examine them thoroughly until the Forms of things and the Structures of bodies have been further investigated and brought to light. For it will be time to seek, apply, and fit our instruments, when we have determined on our models.

4. The fourth mode of operating is by Continuance, which is indeed the steward and, as it were, the almoner of Nature. We call it Continuance when any body is left to itself for a considerable time, being meanwhile protected from external force. For then only the internal motions exhibit and perfect themselves, when the extraneous and adventitious motions cease. Now the results of time are far more

subtle than those of fire. For wine cannot be so clarified by fire as it is by time ; nor are the ashes resulting from fire as exquisite as the dust into which substances are resolved and consumed in the course of ages. Again, the sudden and precipitate incorporations and minglings which are brought about by fire are far inferior to those which result from Continuance. And the dissimilar and varied structures which are assumed by bodies in the course of time, as putrefactions, are destroyed by fire or violent heat. Meanwhile it would not be going out of our way to remark that the motions of bodies under complete confinement have some violence. For such restraint impedes the spontaneous motion of a body : and therefore continuance in an open vessel is most conducive to separations ; in a vessel perfectly closed to mixtures ; in one partly closed, but allowing the entrance of the air, to putrefaction. However, Instances of the operations and effects of Continuance must be carefully collected from all quarters.

5. The regulation of motion, which is the fifth mode of operating, is of no little value. We call it regulation of motion when one body, meeting another, impedes, repels, admits, directs its spontaneous motion. It consists, for the most part, in the shape and position of vessels. Thus the upright cone in alembics assists the condensation of vapours, but the inverted cone assists the refining of sugar in vessels which lie flat. Sometimes also a curved shape is necessary, or one alternately contracting and widening, and the like. Indeed all percolation admits of this explanation,—that the meeting body opens the way to one portion of the body, and shuts it to another. Nor does percolation, or any other regulation of motion, always take place from without, but also by means of another body inside the body ; as when pebbles are dropped into water to collect its earthy parts ; when syrups are clarified with white of eggs, that the coarser parts may adhere and afterwards be separated. To this regulation of motion Telesius has also carelessly and unskilfully attributed the figures of animals, which, he says, are owing to the channels and folds in the womb. But he ought to have noticed the similar formation in the case of eggs, which have neither wrinkles nor inequalities. But it is true that the regulation of motion produces the shapes in mouldings and castings.

6. The operations by agreement or aversion (the sixth method) often lie deeply hidden. For occult and specific properties, as they call them, and sympathies and antipathies, are, to a great extent, the bane of Philosophy. Nor can we hope much for the discovery of the sympathies of things before we have discovered simple Forms and Structures. For agreement is nothing but the mutual symmetry of Forms and Structures.

But the greater and more universal agreements of things are not utterly obscure ; and so we must begin with them. Their first and chief diversity is this : that some bodies differ very much in quantity and rarity of matter, and yet agree in structure ; while others agree as to density and rarity, but differ in structure. For it has not been

ill-observed by chemists, in their trial of elementary bodies, that sulphur and mercury permeate everything. (For their views concerning salt are foolish, being introduced to enable them to comprehend bodies of an earthy, dry, and fixed nature.) But certainly in the two former there seems to be distinguishable one of the most general consents in Nature. For sulphur agrees with oil, with fatty exhalations, with flame, and perhaps with the body of a star. On the other hand, mercury agrees with water and watery vapours, with air, and perhaps with the pure ether existing among the stars. Still these two quarters, or great tribes of things (each in its order) differ in quantity and density of matter, but agree very closely in structure, as appears in very many instances; while different metals agree pretty much in quantity and density (especially when compared with vegetables, &c.), but differ much in structure. In like manner different vegetables and animals vary almost infinitely in structure, but, as regards quantity or density of matter, lie within very few degrees of one another.

Next follows that agreement which is most universal after the former, viz., that of principal bodies and their supports, that is, their menstrua and aliments. And so inquiry must be made under what climates, in what earth, and at what depth each metal is generated; and similarly of gems, whether found in rocks or among minerals; and in what soil each kind of tree, shrub, and herb most flourishes and rejoices; and at the same time what method of fertilization, either by manure of any kind, or by chalk, sea-sand, ashes, &c., is most beneficial, and the special adaptation of these to the various soils. Again, the budding and grafting of trees, and the method in each case; for instance, what plants are best grafted upon what, &c., depends much upon sympathy. Under which head it would not be inappropriate to make the experiment, which we have heard has been lately tried, of engrafting forest trees (a practice hitherto confined to fruit trees), whereby the leaves and fruit are greatly enlarged, and the trees become more shady. Similarly the nourishment of animals must be respectively noted *in genere*, and with their negations. For herbs will not sustain carnivorous animals. Whence the order of Vegetarians (though in man the will has more power over the body than in other animals) has, after due trial, as they say, almost disappeared, their system proving intolerable to human nature. Also the different materials of putrefaction, whence animalculæ are generated, are to be observed.

The agreements of principal bodies with their subordinates (for such these which we have noted may be considered) are sufficiently clear. To which may be added the agreements of the senses with their objects. And since these agreements are very manifest, if they be well noted and keenly examined, they may cast great light on other kinds of agreement which are latent.

But the inner agreements and aversions of bodies, or friendships and strifes (for we are almost weary of the words *sympathy* and *antipathy*, on account of the superstitions and vanities connected with

them), are either falsely ascribed, or intermixed with fables, or, from neglect, very rarely met with. For if any one were to assert that there is enmity between the vine and colewort, because when planted near one another they are less thriving, the reason is ready—that both plants are succulent, and each, by robbing the ground, defrauds the other of its share of nourishment. If it be said that there is agreement and friendship between corn and the cornflower, or the wild poppy, because these plants hardly ever flourish except in cultivated ground, it ought rather to have been asserted that there is enmity between them, because the poppy and cornflower are produced and created by those juices of the soil which the corn has left and rejected; so that the sowing of corn prepares the ground for their growth. And the number of false ascriptions of this kind is great. And as to fables they must be utterly rooted up. There remains, indeed, a small number of these agreements, which are certainly proved by experiment, such as those of the magnet and iron, of gold, and quicksilver, and the like. In chemical experiments on metals there are found some others worthy of observation. But they are found in greatest number (in comparison with their usual variety) in some medicines, which, through their occult (as they call them) and specific properties have relation either to members, or humours, or diseases, or sometimes to individual Natures. Nor should we omit the agreements between the movements and changes of the moon and the affections of bodies below, as they can be gathered and received from a strict and honest selection from experiments in agriculture, navigation, and medicine, or elsewhere. But the rarer the universal Instances of more secret agreements are, the more diligently should they be investigated, by means of traditions and trustworthily and honest relations, provided this be done without any levity or credulity, but with an anxious and, as it were, doubting faith. There remains the agreement of bodies in their mode of operation, inartificial, indeed, but *Polychrest* in kind; and this must on no account be omitted, but be investigated with careful observation. It is the readiness or difficulty of bodies to come together by composition or simple apposition. For some bodies are easily and readily combined and incorporated, but others with difficulty and reluctance. Thus powders mix best with water, ashes and lime with oil, and so on. Nor should we gather merely Instances of the propensity or aversion of bodies to being mingled, but also of their collocation of parts, of their distribution, and digestion after being mixed, and lastly of predominance after mixture is completed.

7. There remains, finally, the seventh and last of these modes of action; namely, operation by the alternation and interchanging of the other six: but it will not be seasonable to propound examples concerning this, until we have inquired somewhat more deeply into each of the others. Now a series or chain of such alternations, accommodated to each particular effect, is a thing at once most difficult to discover, and most efficacious in operation. But the greatest impatience as to the investigation and practice of this kind detains and occupies men's

minds, and yet it is a kind of clue to the labyrinth for greater results. Let this suffice for examples of *Polychrest Instances*.

li. Among *Prerogative Instances* we shall put in the twenty-seventh and last place, *Magical Instances*. By this name we call those in which the material or efficient is slight or small compared with the magnitude of the effect which follows ; so that, even though they are common, yet they are almost miraculous, some at the first glance, others after more attentive contemplation. But these Nature supplies sparingly, when left to herself ; what she will do when her lap has been shaken out, and after the discovery of Forms, and Processes, and Structures, will appear in times to come. But these magical results (so far as we can as yet conjecture) are brought about in three ways ; either by self-multiplication, as in fire, and in poisons called specifics, and also in motions which are strengthened as they pass on from wheel to wheel ; or by the exciting or invitation of another body, as in the magnet, which excites innumerable needles, without any loss or diminution of its virtue, or in heaven and the like ; or by anticipation of motion, as has been already mentioned in the case of gun-powder, cannon, and mines : of these the two former involve an investigation of agreements, the third of measure of motions. Whether or no there is any method of changing bodies *per minima*, as they call it, and of transforming the more subtle structures of bodies (a proceeding which has relation to every kind of transformation of bodies), so that Art may be enabled to do in a short time what Nature does with difficulty and after many windings : is a question about which we have, as yet, no certain indications. And as in matters solid and true we aspire to what is final and supreme, so do we ever hate and, as far as it is in our power, banish, what is vain and pretentious.

lii. So much for the *Dignities* or *Prerogatives* of *Instances*. But we must remind the reader that in this Organum of ours we are treating of Logic and not of Philosophy. But as our logic is intended to inform and instruct the Intellect, not to grasp at and try to hold abstractions with the slender tendrils of the mind (as common logic does), but really to dissect Nature and discover the virtues and actions of bodies, and their laws as determined in matter ; so that this Science flows not merely from the Nature of the mind, but also from the Nature of things ; no wonder that it is everywhere sprinkled and illustrated with speculations and experiments in Nature, as examples of our art. It appears, then, from what has been said, that there are twenty-seven Prerogative Instances. Namely, *Solitary Instances*, *Migrating Instances*, *Ostensive Instances*, *Clandestine Instances*, *Constitutive Instances*, *Conformable Instances*, *Singular Instances*, *Deviating Instances*, *Limiting Instances*, *Instances of Power*, *Accompanying and Hostile Instances*, *Subjunctive Instances*, *Instances of Alliance*, *Instances of the Cross*, *Instances of Divorce*, *Instances of the Door*, *Summoning Instances*, *Instances of the Way*, *Supplementary Instances*, *Dissecting Instances*, *Instances of the Rod*, *Instances of the Course*, *Doses of Nature*, *Instances of the Struggle*, *Suggestive Instances*,

Polychrest Instances, Magical Instances. Now the use of these Instances, wherein they excel common Instances, lies either in the informative part, or in the operative, or in both. As regards the informative, they aid either the sense or the understanding: the sense, as the five *Instances of the Lamp*: the understanding, either by hastening the exclusion of the Form, as the *Solitary Instances*; or by narrowing and indicating more nearly the affirmative of the Form, as the *Migrating, Ostensive, Accompanying, and Subjunctive Instances*; or by exalting the understanding, and leading it to genera and common Natures; either immediately, as the *Chamæstine and Singular Instances*, and those of *Alliance*; or in the next degree, as the *Constitutive*; or in the lowest, as the *Conformable*; or by setting the understanding right when led away by habit, as *Deviating Instances*; or by leading it to the great form or fabric of the Universe, as *Limiting Instances*; or by guarding it against false forms and causes, as *Instances of the Cross and of Divorce*. In the operative part they either indicate, or measure, or assist practice. They indicate it by showing with what we should begin, that we may not do what is already done, as *Instances of Power*; or to do what we should aspire, if means were granted us, as the *Suggestive Instances*. The four *Mathematical Instances* measure practice; the *Polychrest and Magical* assist it.

Again, out of these twenty-seven Instances we must make a collection of some (as we have said above) now at starting, without waiting for a particular investigation of Natures. Of this kind are the *Conformable, Singular, Deviating, Limiting Instances*; also those of *Power, of the Door, the Suggestive, the Polychrest, and the Magical*. For these either assist and cure the understanding and senses, or prepare the way for practice generally. The rest need not be inquired into until we come to make *Tables of Presentation* for the work of the interpreter concerning some particular Nature. For the *Instances* marked and endowed with these *Prerogatives* are as a soul among the common *Instances of Presentation*; and, as we said in the beginning, a few of them serve as well as many; and therefore, when we construct our tables, they must be investigated with all zeal, and recorded therein. It will be necessary to mention them in what follows, and so we have been obliged to treat of them beforehand. But we must now go on to the *Supports and Rectifications of Induction*, and then to *Concretes and Latent Processes and Latent Structures*, and the rest, as we have set forth in order in the twenty-first Aphorism: that at length (like honest and faithful guardians) we may hand over to men their fortunes, now that their understanding has been emancipated and, as it were, come of age; whence there cannot fail to follow an improvement in man's condition, and an increase in his power over Nature. For man, by the fall, fell at once from his state of innocence and from his kingship over creation. Both of these misfortunes, however, can, even in this life, be in some part repaired; the former by Religion and Faith, the latter by the Arts and Sciences. For the curse did not make Creation entirely and for ever rebellious; but in

virtue of that edict, "In the sweat of thy brow shalt thou eat bread," it is now, by various labours (assuredly not by disputations or idle magical ceremonies), at length, in some measure, subdued into supplying bread for man ; that is, to the uses of human life.

FRANCIS OF VERULAM'S
GREAT INSTAURATION.



ANNOUNCEMENT OF THE AUTHOR.

FRANCIS OF VERULAM THOUGHT THUS, AND SUCH IS THE METHOD WHICH HE DETERMINED WITHIN HIMSELF, AND WHICH HE THOUGHT IT CONCERNED THE LIVING AND POSTERITY TO KNOW.

BEING convinced, by a careful observation, that the human understanding perplexes itself, or makes not a sober and advantageous use of the real helps within its reach, whence manifold ignorance and inconveniences arise, he was determined to employ his utmost endeavours towards restoring or cultivating a just and legitimate familiarity betwixt the mind and things.

But as the mind, hastily and without choice, imbibes and treasures up the first notices of things, from whence all the rest proceed, errors must for ever prevail, and remain uncorrected, either by the natural powers of the understanding or the assistance of logic ; for the original notions being vitiated, confused, and inconsiderately taken from things, and the secondary ones formed no less rashly, human knowledge itself, the thing employed in all our researches, is not well put together nor justly formed, but resembles a magnificent structure that has no foundation.

And whilst men agree to admire and magnify the false powers of the mind, and neglect or destroy those that might be rendered true, there is no other course left but with better assistance to begin the work anew, and raise or rebuild the sciences, arts, and all human knowledge from a firm and solid basis.

This may at first seem an infinite scheme, unequal to human abilities, yet it will be found more sound and judicious than the course hitherto pursued, as tending to some issue ; whereas all hitherto done with regard to the sciences is vertiginous, or in the way of perpetual rotation.

Nor is he ignorant that he stands alone in an experiment almost

too bold and astonishing to obtain credit, yet he thought it not right to desert either the cause or himself, but to boldly enter on the way and explore the only path which is pervious to the human mind. For it is wiser to engage in an undertaking that admits of some termination, than to involve oneself in perpetual exertion and anxiety about what is interminable. The ways of contemplation, indeed, nearly correspond to two roads in nature, one of which, steep and rugged at the commencement, terminates in a plain; the other, at first view smooth and easy, leads only to huge rocks and precipices. Uncertain, however, whether these reflections would occur to another, and observing that he had never met any person disposed to apply his mind to similar thoughts, he determined to publish whatsoever he found time to perfect. Nor is this the haste of ambition, but anxiety, that if he should die there might remain behind him some outline and determination of the matter his mind had embraced, as well as some mark of his sincere and earnest affection to promote the happiness of mankind.

AUTHOR'S PREFACE.

Of the state of learning—That it is neither prosperous nor greatly advanced, and that a way must be opened to the human understanding entirely distinct from that known to our predecessors, and different aids procured, that the mind may exercise her power over the nature of things.

It appears to me that men know neither their acquirements nor their powers, but fancy their possessions greater and their faculties less than they are; whence, either valuing the received arts above measure, they look out no farther; or else despising themselves too much, they exercise their talents upon lighter matters, without attempting the capital things of all. And hence the sciences seem to have their Hercules' Pillars, which bound the desires and hopes of mankind.

But as a false imagination of plenty is among the principal causes of want, and as too great a confidence in things present leads to a neglect of the future, it is necessary we should here admonish mankind that they do not too highly value or extol either the number or usefulness of the things hitherto discovered; for, by closely inspecting the multiplicity of books upon arts and sciences, we find them to contain numberless repetitions of the same things in point of invention, but differing indeed as to the manner of treatment; so that the real discoveries, though at the first view they may appear numerous, prove upon examination but few. And as to the point of usefulness, the philosophy we principally received from the Greeks must be acknowledged puerile, or rather talkative than generative—as being fruitful in controversies, but barren of effects.

The fable of Scylla seems a civil representation of the present condition of knowledge; for she exhibited the countenance and expression of a virgin, whilst barking monsters encircled her womb. Even thus the sciences have their specious and plausible generalities;

but when we descend to particulars, which, like the organs of generation, should produce fruits and effects, then spring up loud altercations and controversies, which terminate in barren sterility. And had this not been a lifeless kind of philosophy, it were scarce possible it should have made so little progress in so many ages, insomuch, that not only positions now frequently remain positions still, but questions remain questions, rather riveted and cherished than determined by disputes; philosophy thus coming down to us in the persons of master and scholar, instead of inventor and improver. In the mechanic arts the case is otherwise--these commonly advancing towards perfection in a course of daily improvement, from a rough unpolished state, sometimes prejudicial to the first inventors, whilst philosophy and the intellectual sciences are, like statues, celebrated and adored, but never advanced; nay, they sometimes appear most perfect in the original author, and afterwards degenerate. For since men have gone over in crowds to the opinion of their leader, like those silent senators of Rome, they add nothing to the extent of learning themselves, but perform the servile duty of waiting upon particular authors, and repeating their doctrines.

It is a fatal mistake to suppose that the sciences have gradually arrived at a state of perfection, and then been recorded by some one writer or other; and that as nothing better can afterwards be invented, men need but cultivate and set off what is thus discovered and completed; whereas, in reality, the registering of the sciences proceeds only from the assurance of a few and the sloth and ignorance of many. For after the sciences might thus perhaps in several parts be carefully cultivated; a man of an enterprising genius rising up, who, by the conciseness of his method, renders himself acceptable and famous, he in appearance erects an art, but in reality corrupts the labours of his predecessors. This, however, is usually well received by posterity, as readily gratifying their curiosity, and indulging their indolence. But he that rests upon established consent as the judgment approved by time, trusts to a very fallacious and weak foundation; for we have but an imperfect knowledge of the discoveries in arts and sciences, made public in different ages and countries, and still less of what has been done by particular persons, and transacted in private; so that neither the births nor misarrriages of time are to be found in our records.

Nor is consent, or the continuance thereof, a thing of any account; for however governments may vary there is but one state of the sciences, and that will for ever be democratical or popular. But the doctrines in greatest vogue among the people, are either the contentious and quarrelsome, or the showy and empty; that is, such as may either entrap the assent, or lull the mind to rest; whence, of course, the greatest geniuses in all ages have suffered violence; whilst out of regard to their own character, they submitted to the judgment of the times, and the populace. And thus when any more sublime speculations happened to appear, they were commonly tossed and extinguished by the breath of popular opinion. Hence time, like a river, has brought

down to us what is light and tumid, but sunk what was ponderous and solid. As to those who have set up for teachers of the sciences, when they drop their character, and at intervals speak their sentiments, they complain of the subtilty of nature, the concealment of truth, the obscurity of things, the entanglement of causes, and the imperfections of the human understanding; thus rather choosing to accuse the common state of men and things, than make confession of themselves. It is also frequent with them to adjudge that impossible in an art, which they find that art does not affect; by which means they screen indolence and ignorance from the reproach they merit. The knowledge delivered down to us is barren in effects, fruitful in questions, slow and languid in improvement, exhibiting in its generalities the counterfeits of perfection, but meagre in its details, popular in its aim, but suspected by its very promoters, and therefore defended and propagated by artifice and chicanery. And even those who by experience propose to enlarge the bounds of the sciences, scarce ever entirely quit the received opinions, and go to the fountain-head, but think it enough to add somewhat of their own; as prudentially considering, that at the time they show their modesty in assenting, they may have a liberty of adding. But whilst this regard is shown to opinions and moral considerations, the sciences are greatly hurt by such a languid procedure; for it is scarce possible at once to admire and excel an author: as water rises no higher than the reservoir it falls from. Such men, therefore, though they improve some things, yet advance the sciences but little, or rather amend than enlarge them.

There have been also bolder spirits, and greater geniuses, who thought themselves at liberty to overturn and destroy the ancient doctrine, and make way for themselves and their opinions; but without any great advantage from the disturbance; as they did not effectively enlarge philosophy and arts by practical works, but only endeavoured to substitute new dogmas, and to transfer the empire of opinion to themselves, with but small advantage; for opposite errors proceed mostly from common causes.

As for those who, neither wedded to their own nor others' opinions, but continuing friends to liberty, make use of assistance in their inquiries, the success they met with did not answer expectation, the attempt, though laudable, being but feeble; for pursuing only the probable reasons of things, they were carried about in a circle of arguments, and taking a promiscuous liberty, preserved not the rigour of true inquirers; whilst none of them duly conversed with experience and things themselves. Others again, who commit themselves to mechanical experience, yet make their experiments at random, without any method of inquiry. And the greatest part of these have no considerable views, but esteem it a great matter if they can make a single discovery; which is both a trifling and unskilful procedure, as no one can justly or successfully discover the nature of any one thing in that thing itself, or without numerous experiments which lead to farther inquiries. And we must not omit to observe, that all the industry displayed in experiment has been directed by too indiscreet a

zeal at some prejudged effect, seeking those which produced fruit rather than knowledge, in opposition to the Divine method, which on the first day created time alone, delaying its material creations until the sun had illumined space.

Lastly, those who recommend logic as the best and surest instrument for improving the sciences, very justly observe, that the understanding, left to itself, ought always to be suspected. But here the remedy is neither equal to the disease, nor approved ; for though the logic in use may be properly applied in civil affairs, and the arts that are founded in discourse and opinion, yet it by no means reaches the subtilty of nature ; and by catching at what it cannot hold, rather serves to establish errors, and fix them deeper, than open the way of truth.

Upon the whole, men do not hitherto appear to be happily inclined and fitted for the sciences, either by their own industry, or the authority of authors, especially as there is little dependence to be had upon the common demonstrations and experiments ; whilst the structure of the universe renders it a labyrinth to the understanding ; where the paths are not only everywhere doubtful, but the appearances of things and their signs deceitful ; and the wreaths and knots of nature intricately turned and twisted : through all which we are only to be conducted by the uncertain light of the senses, that sometimes shines, and sometimes hides its head ; and by collections of experiments and particular facts, in which no guides can be trusted, as wanting direction themselves, and adding to the errors of the rest. In this melancholy state of things, one might be apt to despair both of the understanding left to itself, and of all fortuitous helps ; as of a state irremediable by the utmost efforts of the human genius, or the often-repeated chance of trial. The only clue and method is to begin all anew, and direct our steps in a certain order, from the very first perceptions of the senses. Yet I must not be understood to say that nothing has been done in former ages, for the ancients have shown themselves worthy of admiration in everything which concerned either wit or abstract reflection ; but, as in former ages, when men at sea, directing their course solely by the observation of the stars, might coast along the shores of the continent, but could not trust themselves to the wide ocean, or discover new worlds, until the use of the compass was known : even so the present discoveries referring to matters immediately under the jurisdiction of the senses, are such as might easily result from experience and discussion ; but before we can enter the remote and hidden parts of nature, it is requisite that a better and more perfect application of the human mind should be introduced. This, however, is not to be understood as if nothing had been effected by the immense labours of so many past ages ; as the ancients have performed surprisingly in subjects that required abstract meditation, and force of genius. But as navigation was imperfect before the use of the compass, so will many secrets of nature and art remain undiscovered, without a more perfect knowledge of the understanding, its uses, and ways of working.

For our own part, from an earnest desire of truth, we have committed ourselves to doubtful, difficult, and solitary ways ; and relying on the Divine assistance, have supported our minds against the vehemence of opinions, our own internal doubts and scruples, and the darkness and fantastic images of the mind ; that at length we might make more sure and certain discoveries for the benefit of posterity. And if we shall have affected anything to the purpose, what led us to it was a true and genuine humiliation of mind. Those who before us applied themselves to the discovery of arts, having just glanced upon things, examples, and experiments ; immediately, as if invention was but a kind of contemplation, raised up their own spirits to deliver oracles : whereas our method is continually to dwell among things soberly, without abstracting or setting the understanding farther from them than makes their images meet ; which leaves but little work for genius and mental abilities. And the same humility that we practise in learning, the same we also observe in teaching, without endeavouring to stamp a dignity on any of our inventions, by the triumphs of confutation, the citations of antiquity, the producing of authorities, or the mask of obscurity ; as any one might do, who had rather give lustre to his own name, than light to the minds of others. We offer no violence, and spread no nets for the judgments of men, but lead them on to things themselves, and their relations ; that they may view their own stores, what they have to reason about, and what they may add, or procure, for the common good. And if at any time ourselves have erred, mistook, or broke off too soon, yet as we only propose to exhibit things naked, and open, as they are, our errors may be the readier observed, and separated, before they considerably infect the mass of knowledge ; and our labours be the more easily continued. And thus we hope to establish for ever a true and legitimate union between the experimental and rational faculty, whose fallen and inauspicious divorces and repudiations have disturbed everything in the family of mankind.

But as these great things are not at our disposal, we here, at the entrance of our work, with the utmost humility and fervency, put forth our prayers to God, that remembering the miseries of mankind, and the pilgrimage of this life, where we pass but few days and sorrowful, he would vouchsafe, through our hands, and the hands of others, to whom he has given the like mind, to relieve the human race by a new act of his bounty. We likewise humbly beseech him, that what is human may not clash with what is divine : and that when the ways of the senses are opened, and a greater natural light set up in the mind, nothing of incredulity and blindness towards divine mysteries may arise ; but rather that the understanding, now cleared up, and purged of all vanity and superstition, may remain entirely subject to the divine oracles, and yield to faith, the things that are faith's : and lastly, that expelling the poisonous knowledge infused by the serpent, which puffs up and swells the human mind, we may neither be wise above measure, nor go beyond the bounds of sobriety, but pursue the truth in charity.

We now turn ourselves to men, with a few wholesome admonitions and just requests. And first, we admonish them to continue in a sense of their duty, as to divine matters ; for the senses are like the sun, which displays the face of the earth, but shuts up that of the heavens : and again, that they run not into the contrary extreme, which they certainly will do, if they think an inquiry into nature any way forbid them by religion. It was not that pure and unspotted natural knowledge whereby Adam gave names to things, agreeable to their natures, which caused his fall ; but an ambitious and authoritative desire of moral knowledge, to judge of good and evil, which makes men revolt from God, and obey no laws but those of their own will. But for the sciences, which contemplate nature, the sacred philosopher declares, "It is the glory of God to conceal a thing, but the glory of a king to find it out." As if the Divine Being thus indulgently condescended to exercise the human mind by philosophical inquiries.

In the next place, we advise all mankind to think of the true ends of knowledge, and that they endeavour not after it for curiosity, contention, or the sake of despising others, nor yet for profit, reputation, power, or any such inferior consideration, but solely for the occasions and uses of life ; all along conducting and perfecting it in the spirit of benevolence. Our requests are,—1. That men do not conceive we here deliver an opinion, but a work ; and assure themselves we attempt not to found any sect or particular doctrine, but to fix an extensive basis for the service of human nature. 2. That, for their own sakes, they lay aside the zeal and prejudices of opinions, and endeavour the common good ; and that being, by our assistance, freed and kept clear from the errors and hinderances of the way, they would themselves also take part of the task. 3. That they do not despair, as imagining our project for a grand restoration, or advancement of all kinds of knowledge, infinitely beyond the power of mortals to execute ; whilst in reality, it is the genuine stop and prevention of infinite error. Indeed, as our state is mortal, and human, a full accomplishment cannot be expected in a single age, and must therefore be commended to posterity. Nor could we hope to succeed, if we arrogantly searched for the sciences in the narrow cells of the human understanding, and not submissively in the wider world. 4. In the last place, to prevent ill effects from contention, we desire mankind to consider how far they have a right to judge our performance, upon the foundations here laid down : for we reject all that knowledge which is too hastily abstracted from things, as vague, disorderly, and ill-formed ; and we cannot be expected to abide by a judgment which is itself called in question.

DISTRIBUTION OF THE WORK.

IN SIX PARTS.

1. Survey and Extension of the Sciences ; or, the Advancement of Learning.
2. *Novum Organum* ; or, Precepts for the Interpretation of Nature.
3. Phenomena of the Universe ; or, Natural and Experimental History, on which to found Philosophy.
4. Ladder of the Understanding.
5. Precursors, or Anticipators, of the Second Philosophy.
6. Second Philosophy ; or, Active Science.

WE divide the whole of the work into six parts : the first whereof gives the substance, or general description of the knowledge which mankind at present possess : choosing to dwell a little upon things already received, that we may the easier perfect the old, and lead on to new ; being equally inclined to cultivate the discoveries of antiquity, as to strike out fresh paths of science. In classing the sciences, we comprehend not only the things already invented and known, but also those omitted and wanted ; for the intellectual globe, as well as the terrestrial, has both its frosts and deserts. It is therefore no wonder if we sometimes depart from the common divisions. For an addition, whilst it alters the whole, must necessarily alter the parts, and their sections ; whereas the received divisions are only fitted to the received sum of the sciences, as it now stands. With regard to the things we shall note as defective ; it will be our method to give more than the bare titles, or short heads of what we desire to have done ; with particular care, where the dignity or difficulty of the subject requires it, either to lay down the rules for effecting the work, or make an attempt of our own, by way of example, or pattern, of the whole. For it concerns our own character, no less than the advantage of others, to know that a mere capricious idea has not presented the subject to our mind, and that all we desire and aim at is a wish. For our designs are within the power of all to compass, and we ourselves have certain and evident demonstrations of their utility. We come not hither, as augurs, to measure out regions in our mind by divination, but like generals, to invade them for conquest. And this is the first part of the work.

When we have gone through the ancient arts, we shall prepare the human understanding for pressing on beyond them. The second object of the work embraces the doctrine of a more perfect use of reason, and the true helps of the intellectual faculties, so as to raise and enlarge the powers of the mind ; and, as far as the condition of humanity allows, to fit it to conquer the difficulties and obscurities of nature. The thing we mean, is a kind of logic, by us called *The Art of interpreting Nature* ; as differing widely from the common logic, which, however, pretends to assist and direct the understanding, and

in that they agree : but the difference betwixt them consists in three things, viz., the end, the order of demonstrating, and the grounds of inquiry.

The end of our new logic is to find, not arguments, but arts ; not what agrees with principles, but principles themselves : not probable reasons, but plans and designs of works—a different intention producing a different effect. In one the adversary is conquered by dispute, and in the other nature by works. The nature and order of the demonstrations agree with this object. For in common logic, almost our whole labour is spent upon the syllogism. Logicians hitherto appear scarcely to have noticed induction, passing it over with some slight comment. But we reject the syllogistic method as being too confused, and allowing nature to escape out of our hands. For though nobody can doubt that those things which agree with the middle term agree with each other, nevertheless, there is this source of error, that a syllogism consists of propositions, propositions of words, and words are but the token and signs of things. Now, if the first notions, which are, as it were, the soul of words, and the basis of every philosophical fabric, are hastily abstracted from things, and vague and not clearly defined and limited, the whole structure falls to the ground. We therefore reject the syllogism, and that not only as regards first principles, to which logicians do not apply them, but also with respect to intermediate propositions, which the syllogism contrives to manage in such a way as to render barren in effect, unfit for practice, and clearly unsuited to the active branch of the sciences. Nevertheless, we would leave to the syllogism, and such celebrated and applauded demonstrations, their jurisdiction over popular and speculative acts ; while, in everything relating to the nature of things, we make use of induction for both our major and minor propositions ; for we consider induction as that form of demonstration which closes in upon nature and presses on, and, as it were, mixes itself with action. Whence the common order of demonstrating is absolutely inverted ; for instead of flying immediately from the senses, and particulars, to generals, as to certain fixed poles, about which disputes always turn, and deriving others from these by intermediates, in a short, indeed, but precipitate manner, fit for controversy, but unfit to close with nature ; we continually raise up propositions by degrees, and in the last place, come to the most general axioms, which are not notional, but well defined, and what nature allows of, as entering into the very essence of things.

But the more difficult part of our task consists in the form of induction, and the judgment to be made by it ; for that form of the logicians which proceeds by simple enumeration, is a childish thing, concludes unsafely, lies open to contradictory instances, and regards only common matters ; yet determines nothing : whilst the sciences require such a form of induction, as can separate, adjust, and verify experience, and come to a necessary determination by proper exclusions and rejections.

Nor is this all ; for we likewise lay the foundations of the sciences

stronger and closer, and begin our inquiries deeper than men have hitherto done, bringing those things to the test which the common logic has taken upon trust. The logicians borrow the principles of the sciences from the sciences themselves, venerate the first notions of the mind, and acquiesce in the immediate informations of the senses, when rightly disposed ; but we judge, that a real logic should enter every province of the sciences with a greater authority than their own principles can give ; and that such supposed principles should be examined, till they become absolutely clear and certain. As for first notions of the mind, we suspect all those that the understanding, left to itself, procures ; nor ever allow them till approved and authorized by a second judgment. And with respect to the informations of the senses, we have many ways of examining them ; for the senses are fallacious, though they discover their own errors ; but these lie near, whilst the means of discovery are remote.

The senses are faulty in two respects, as they either fail or deceive us. For there are many things that escape the senses, though ever so rightly disposed ; as by the subtilty of the whole body, or the minuteness of its parts ; the distance of place ; the slowness or velocity of motion ; the commonness of the object, &c. Neither do the senses, when they lay hold of a thing, retain it strongly ; for evidence, and the informations of sense, are in proportion to a man, and not in proportion to the universe. And it is a grand error to assert that sense is the measure of things.

To remedy this, we have from all quarters brought together, and fitted helps for the senses ; and that rather by experiments than by instruments ; apt experiments being much more subtle than the senses themselves, though assisted with the most finished instruments. We, therefore, lay no great stress upon the immediate and natural perceptions of the senses, but desire the senses to judge only of experiments, and experiments to judge of things : on which foundation, we hope to be patrons of the senses, and interpreters of their oracles. And thus we mean to procure the things relating to the light of nature, and the setting it up in the mind ; which might well suffice, if the mind were as white paper. But since the minds of men are so strangely disposed, as not to receive the true images of things, it is necessary also that a remedy be found for this evil.

The idols, or false notions, which possess the mind, are either acquired or innate. The acquired arise either from the opinions or sects of philosophers, or from preposterous laws of demonstration ; but the innate cleave to the nature of the understanding, which is found much more prone to error than the senses. For however men may amuse themselves, and admire, or almost adore the mind, it is certain, that like an irregular glass, it alters the rays of things, by its figure, and different intersections.

The two former kinds of idols may be extirpated, though with difficulty ; but this third is insuperable. All that can be done, is to point them out, and mark, and convict that treacherous faculty of the mind ; lest when the ancient errors are destroyed, new ones should

sprout out from the rankness of the soil : and, on the other hand, to establish this for ever, that the understanding can make no judgment but by induction, and the just form thereof. Whence the doctrine of purging the understanding requires three kinds of confutations, to fit it for the investigation of truth ; viz., the confutation of philosophies, the confutation of demonstrations, and the confutation of the natural reason. But when these have been completed, and it has been clearly seen what results are to be expected from the nature of things, and the nature of the human mind, we shall have then furnished a nuptial couch for the mind and the universe, the divine goodness being our bridemaids. And let it be the prayer of our Epithalamium, that assistance to man may spring from this union, and a race of discoveries, which will contribute to his wants and vanquish his miseries. And this is the second part of the work.

But as we propose not only to pave and show the way, but also to tread in it ourselves, we shall next exhibit the phenomena of the universe ; that is, such experience of all kinds, and such a natural history, as may afford a foundation to philosophy. For as no fine method of demonstration, or form of explaining nature, can preserve the mind from error, and support it from falling ; so neither can it hence receive any matter of science. Those, therefore, who determine not to conjecture and guess, but to find out and know ; not to invent fables and romances of worlds, but to look into and dissect the nature of this real world, must consult only things themselves. Nor can any force of genius, thought, or argument, be substituted for this labour, search, and inspection ; not even though all the wits of men were united : this, therefore, must either be had, or the business be deserted for ever.

But the conduct of mankind has hitherto been such, that it is no wonder nature has not opened herself to them. For the information of the senses is treacherous and deceitful ; observation careless, irregular, and accidental ; tradition idle, rumorous, and vain ; practice narrow and servile ; experience blind, stupid, vague, and broken ; and natural history extremely light and empty : wretched materials for the understanding to fashion into philosophy and the sciences ! Then comes in a preposterous subtilty of argumentation and sifting, as a last remedy, that mends not the matter one jot, nor separates the errors. Whence there are absolutely no hopes of enlarging and promoting the sciences, without rebuilding them.

The first materials for this purpose must be taken from a new kind of natural history. The understanding must also have fit subjects to work upon, as well as real helps to work with. But our history, no less than our logic, differs from the common in many respects ; particularly, 1. In its end, or office ; 2. Its collection ; 3. Its subtilty ; 4. Its choice ; and 5. Its appointment for what is to follow.

Our natural history is not designed so much to please by its variety, or benefit by gainful experiments, as to afford light to the discovery of causes, and hold out the breasts to philosophy ; for though we principally regard works and the active parts of the sciences, yet we wait for

the time of harvest, and would not reap the blade for the ear. . We are well aware that axioms, rightly framed, will draw after them whole sheaves of works : but for that untimely and childish desire of seeing fruits of new works before the season, we absolutely condemn and reject it, as the golden apple that hinders the progress.

With regard to its collection ; we propose to show nature not only in a free state, as in the history of meteors, minerals, plants, and animals ; but more particularly as she is bound, and tortured, pressed, formed, and turned out of her course by art and human industry. Hence we would set down all opposite experiments of the mechanic and liberal arts, with many others not yet formed into arts ; for the nature of things is better discovered by the torturings of art, than when they are left to themselves. Nor is it only a history of bodies that we would give ; but also of their cardinal virtues, or fundamental qualities ; as density, rarity, heat, cold, &c., which should be comprised in particular histories.

The kind of experiments to be procured for our history are much more subtile and simple than the common ; abundance of them must be recovered from darkness, and are such as no one would have inquired after, that was not led by constant and certain tract to the discovery of causes ; as being in themselves of no great use, and consequently not sought for their own sake, but with regard to works : like the letters of the alphabet with regard to discourse.

In the choice of our narratives and experiments we hope to have shown more care than the other writers of natural history ; as receiving nothing but upon ocular demonstration, or the strictest scrutiny of examination ; and not heightening what is delivered to increase its miraculousness, but thoroughly purging it of superstition and fable. Besides this, we reject, with a particular mark, all those boasted and received falsehoods, which by a strange neglect have prevailed for so many ages, that they may no longer molest the sciences. For as the idle tales of nurses do really corrupt the minds of children, we cannot too carefully guard the infancy of philosophy from all vanity and superstition. And when any new or more curious experiment is offered, though it may seem to us certain and well founded ; yet we expressly add the manner wherein it was made ; that, after it shall be understood how things appear to us, men may beware of any error adhering to them, and search after more infallible proofs. We, likewise, all along interpose our directions, scruples, and cautions ; and religiously guard against phantoms and illusions.

Lastly, having well observed how far experiments and history distract the mind ; and how difficult it is, especially for tender or prejudiced persons, to converse with nature from the beginning, we shall continually subjoin our observations, as so many first glances of natural history at philosophy ; and this to give mankind some earnest, that they shall not be kept perpetually floating upon the waves of history ; and that when they come to the work of the understanding, and the explanation of nature, they may find all things in greater readiness. This will conclude the third part.

After the understanding has been thus aided and fortified, we shall be prepared to enter upon philosophy itself. But in so difficult a task, there are certain things to be observed, as well for instruction as for present use. The first is to propose examples of inquiry and investigation, according to our own method, in certain subjects of the noblest kind, but greatly differing from each other, that a specimen may be had of every sort. By these examples we mean not illustrations of rules and precepts, but perfect models, which will exemplify the second part of this work, and represent, as it were, to the eye, the whole progress of the mind, and the continued structure and order of invention, in the most chosen subjects, after the same manner as globes and machines facilitate the more abstruse and subtile demonstrations in mathematics. We assign the fourth part of our work to these examples, which are nothing else than a particular application of the second part of our undertaking.

The fifth part is only temporary, or of use but till the rest are finished ; whence we look upon it as interest till the principal be paid ; for we do not propose to travel hoodwinked, so as to take no notice of what may occur of use in the way. This part, therefore, will consist of such things as we have invented, experienced, or added, by the same common use of the understanding that others employ. For as we have greater hopes for our constant conversation with nature, than from our force of genius, the discoveries we shall thus make may serve as inns on the road, for the mind to repose in, during its progress to greater certainties. But this, without being at all disposed to abide by anything that is not discovered, or proved, by the true form of induction. Nor need any one be shocked at this suspension of the judgment, in a doctrine which does not assert that nothing is knowable ; but only that things cannot be known except in a certain order and method : whilst it allows particular degrees of certainty, for the sake of commodiousness and use, until the mind shall enter on the explanation of causes. Nor were those schools of philosophers, who held positive truth to be unattainable, inferior to others who dogmatized at will. They did not, however, like us, prepare helps for the guidance of the senses and understanding, as we have done, but at once abolished all belief and authority, which is a totally different and almost opposite matter.

The sixth and last part of our work, to which all the rest are subservient, is to lay down that philosophy which shall flow from the just, pure, and strict inquiry hitherto proposed. But to perfect this, is beyond both our abilities and our hopes, yet we shall lay the foundations of it, and recommend the superstructure to posterity. We design no contemptible beginning to the work ; and anticipate that the fortune of mankind will lead it to such a termination as is not possible for the present race of men to conceive. The point in view is not only the contemplative happiness, but the whole fortunes, and affairs, and powers, and works of men. For man being the minister and interpreter of nature, acts and understands so far as he has observed of the order, the works and mind of nature, and can proceed

no farther ; for no power is able to loose or break the chain of causes, nor is nature to be conquered but by submission : whence those twin intentions, human knowledge and human power, are really coincident ; and the greatest hinderance to works is the ignorance of causes.

The capital precept for the whole undertaking is this, that the eye of the mind be never taken off from things themselves, but receive their images truly as they are. And God forbid that ever we should offer the dreams of fancy for a model of the world ; but rather in his kindness vouchsafe to us the means of writing a revelation and true vision of the traces and moulds of the Creator in his creatures.

May thou, therefore, O Father, who gavest the light of vision as the first fruit of creation, and who hast spread over the fall of man the light of thy understanding as the accomplishment of thy works, guard and direct this work, which, issuing from thy goodness, seeks in return thy glory ! When thou hadst surveyed the works which thy hands had wrought, all seemed good in thy sight, and Thou restedst. But when man turned to the works of his hands, he found all vanity and vexation of spirit, and experienced no rest. If, however, we labour in thy works, Thou wilt make us to partake of thy vision and sabbath ; we, therefore, humbly beseech Thee to strengthen our purpose, that Thou mayst be willing to endow thy family of mankind with new gifts, through our hands, and the hands of those in whom Thou shalt implant the same spirit.

THE WISDOM OF THE ANCIENTS.

THE PREFACE.

THE earliest antiquity lies buried in silence and oblivion, excepting the remains we have of it in sacred writ. This silence was succeeded by poetical fables, and these, at length, by the writings we now enjoy ; so that the concealed and secret learning of the ancients seems separated from the history and knowledge of the following ages by a veil, or partition-wall of fables, interposing between the things that are lost and those that remain.

Many may imagine that I am here entering upon a work of fancy, or amusement, and design to use a poetical liberty, in explaining poetical fables. It is true, fables in general are composed of ductile matter, that may be drawn into great variety by a witty talent or an inventive genius, and be delivered of plausible meanings which they never contained. But this procedure has already been carried to excess ; and great numbers, to procure the sanction of antiquity to their own notions and inventions, have miserably wrested and abused the fables of the ancients.

Nor is this only a late or unfrequent practice, but of ancient date, and common even to this day. Thus Chrysippus, like an interpreter of dreams, attributed the opinions of the Stoics to the poets of old ; and the chemists, at present, more childishly apply the poetical transformations to their experiments of the furnace. And though I have well weighed and considered all this, and thoroughly seen into the levity which the mind indulges for allegories and allusions, yet I cannot but retain a high value for the ancient mythology. And, certainly, it were very injudicious to suffer the fondness and licentiousness of a few to detract from the honour of allegory and parable in general. This would be rash, and almost profane ; for, since religion delight in such shadows and disguises, to abolish them were, in a manner, to prohibit a ¹ intercourse betwixt things divine and human.

Upon deliberate consideration, my judgment is, that a concealed instruction and allegory was originally intended in many of the ancient fables. This opinion may, in some respect, be owing to the veneration I have for antiquity, but more to observing that some fables discover a great and evident similitude, relation, and connection with the thing they signify, as well in the structure of the fable as in the propriety of the names whereby the persons or actors are characterized ; inasmuch, that no one could positively deny a sense and meaning to be from the first intended, and purposely shadowed out in them. For who can hear that Fame, after the giants were destroyed, sprung up as their posthumous sister, and not apply it to the clamour of parties and the seditious rumours which commonly fly about for a time upon the quelling of insurrections ? Or who can read how the giant Typhon cut out and carried away Jupiter's sinews—which Mercury afterwards stole and again restored to Jupiter—and not presently observe that this allegory denotes strong and powerful rebellions, which cut away from kings their sinews, both of money and authority ; and that the way to have them restored is by lenity, affability, and prudent edicts, which soon reconcile, and as it were steal upon the affections of the subject ? Or who, upon hearing that memorable expedition of

the gods against the giants, when the braying of Silenus's ass greatly contributed in putting the giants to flight, does not clearly conceive that this directly points at the monstrous enterprises of rebellious subjects, which are frequently frustrated and disappointed by vain fears and empty rumours?

Again, the conformity and purport of the names is frequently manifest and self-evident. Thus Metis, the wife of Jupiter, plainly signifies counsel; Typhon, swelling; Pan, universality; Nemesis, revenge, &c. Nor is it a wonder, if sometimes a piece of history or other things are introduced, by way of ornament; or if the times of the action are confounded; or if part of one fable be tacked to another; or if the allegory be new turned; for all this must necessarily happen, as the fables were the inventions of men who lived in different ages and had different views; some of them being ancient, others more modern; some having an eye to natural philosophy, and others to morality or civil policy.

It may pass for a farther indication of a concealed and secret meaning, that some of these fables are so absurd and idle in their narration as to show and proclaim an allegory, even afar off. A fable that carries probability with it may be supposed invented for pleasure, or in imitation of history; but those that could never be conceived or related in this way must surely have a different use. For example, what a monstrous fiction is this, that Jupiter should take Metis to wife, and as soon as he found her pregnant eat her up, whereby he also conceived, and out of his head brought forth Pallas armed. Certainly no mortal could, but for the sake of the moral it couches, invent such an absurd dream as this, so much out of the road of thought!

But the argument of most weight with me is this, that many of these fables by no means appear to have been invented by the persons who relate and divulge them, whether Homer, Hesiod, or others; for if I were assured they first flowed from those later times and authors that transmit them to us, I should never expect anything singularly great or noble from such an origin. But whoever attentively considers the thing, will find that these fables are delivered down and related by those writers, not as matters then first invented and proposed, but as things received and embraced in earlier ages. Besides, as they are differently related by writers nearly of the same ages, it is easily perceived that the relators drew from the common stock of ancient tradition, and varied but in point of embellishment, which is their own. And this principally raises my esteem of these fables, which I receive, not as the product of the age, or invention of the poets, but as sacred relics, gentle whispers, and the breath of better times, that from the traditions of more ancient nations came, at length, into the flutes and trumpets of the Greeks. But if any one shall, notwithstanding this, contend that allegories are always adventitious, or imposed upon the ancient fables, and no way native or genuinely contained in them, we might here leave him undisturbed in that gravity of judgment he affects (though we cannot help accounting it somewhat dull and phlegmatic), and if it were worth the trouble, proceed to another kind of argument.

Men have proposed to answer two different and contrary ends by the use of parable; for parables serve as well to instruct or illustrate as to wrap up and envelop, so that though, for the present, we drop the concealed use, and suppose the ancient fables to be vague, undeterminate things, formed for amusement, still the other use must remain, and can never be given up. And every man, of any learning, must readily allow that this method of instructing is grave, sober, or exceedingly useful, and sometimes necessary in the sciences, as it opens an easy and familiar passage to the human understanding, in all new discoveries that are abstruse and out of the road of vulgar opinions. Hence, in the first ages, when such inventions and conclusions of the human reason as are now trite and common were new and little known, all things abounded with fables, parables, similes, comparisons, and allusions, which were not intended to conceal, but to inform and teach, whilst the minds of men continued rude and unpractised in matters of subtilty and speculation, or even impatient, and in a manner incapable of receiving such things as did not directly fall under and strike the senses. For as hieroglyphics were in use before writing, so were parables in use before argu-

ments. And even to this day, if any man would let new light in upon the human understanding, and conquer prejudice, without raising contests, animosities, opposition, or disturbance, he must still go in the same path, and have recourse to the like method of allegory, metaphor, and allusion.

To conclude, the knowledge of the early ages was either great or happy; great, if they by design made this use of trope and figure; happy, if, whilst they had other views, they afforded matter and occasion to such noble contemplations. Let either be the case, our pains, perhaps, will not be misemployed, whether we illustrate antiquity or things themselves.

The like has been attempted by others; but to speak ingenuously, their great and voluminous labours have almost destroyed the energy, the efficacy, and grace of the thing, whilst, being unskilled in nature, and their learning no more than that of common-place, they have applied the sense of the parables to certain general and vulgar matter, without reaching to their real purport, genuine interpretation, and full depth. For myself, therefore, I expect to appear new in these common things, because, leaving untouched such as are sufficiently plain and open, I shall drive only at those that are either deep or rich.

I.—THE FABLE OF CÆLUM.

EXPLAINED OF THE CREATION, OR ORIGIN OF ALL THINGS.

THE poets relate that Cælum was the most ancient of all the gods; that his parts of generation were cut off by his son Saturn; that Saturn had a numerous offspring, but devoured all his sons, as soon as they were born; that Jupiter at length escaped the common fate; and when grown up, drove his father Saturn into Tartarus; usurped the kingdom; cut off his father's genitals, with the same knife wherewith Saturn had dismembered Cælum, and throwing them into the sea, thence sprung Venus.

Before Jupiter was well established in his empire, two memorable wars were made upon him: the first by the Titans, in subduing of whom, Sol, the only one of the Titans who favoured Jupiter, performed him singular service; the second by the giants, whom being destroyed and subdued by the thunder and arms of Jupiter, he now reigned secure.

EXPLANATION.—This fable appears to be an enigmatical account of the origin of all things, not greatly differing from the philosophy afterwards embraced by Democritus, who expressly asserts the eternity of matter, but denies the eternity of the world; thereby approaching to the truth of sacred writ, which makes chaos, or uninformed matter, to exist before the six days' works.

The meaning of the fable seems to be this: Cælum denotes the concave space, or vaulted roof that incloses all matter, and Saturn the matter itself, which cuts off all power of generation from his father; as one and the same quantity of matter remains invariable in nature,

without addition or diminution.* But the agitations and struggling motions of matter first produced certain imperfect and ill-joined compositions of things, as it were so many first rudiments, or essays of worlds; till, in process of time, there arose a fabric capable of preserving its form and structure. Whence the first age was shadowed out by the reign of Saturn; who, on account of the frequent dissolutions and short durations of things, was said to devour his children. And the second age was denoted by the reign of Jupiter; who thrust or drove those frequent and transitory changes into Tartarus—a place expressive of disorder. This place seems to be the middle space, between the lower heavens and the internal parts of the earth, wherein disorder, imperfection, mutation, mortality, destruction, and corruption, are principally found.

Venus was not born during the former generation of things, under the reign of Saturn; for whilst discord and jar had the upper hand of concord and uniformity in the matter of the universe, a change of the entire structure was necessary. And in this manner things were generated and destroyed before Saturn was dismembered. But when this matter of generation ceased,† there immediately followed another, brought about by Venus, or a perfect and established harmony of things; whereby changes were wrought in the parts, whilst the universal fabric remained entire and undisturbed. Saturn, however, is said to be thrust out and dethroned, not killed, and become extinct; because, agreeably to the opinion of Democritus, the world might relapse into its old confusion and disorder, which Lucretius hoped would not happen in his time.‡

But now, when the world was compact, and held together by its own bulk and energy, yet there was no rest from the beginning; for, first, there followed considerable motions and disturbances in the celestial regions, though so regulated and moderated by the power of the Sun, prevailing over the heavenly bodies, as to continue the world in its state. Afterwards there followed the like in the lower parts, by inundations, storms, winds, general earthquakes, etc., which, however, being subdued and kept under, there ensued a more peaceable and lasting harmony, and consent of things.

It may be said of this fable, that it includes philosophy; and again, that philosophy includes the fable; for we know, by faith, that all these things are but the oracle of sense, long since ceased and decayed; but the matter and fabric of the world being justly attributed to a creator.

* The original quantity of matter remaining invariably the same, explains that circumstance in the fable of the same knife being used for the dismembering of Saturn as had before been used for the dismembering of Coelum.

† Viz., when Jupiter possessed the throne; or after a durable world was formed. Let the figurative or personifying manner of expression, usual among the poets, be all along considered.

‡ "Quod procul a nobis flectat Fortuna gubernans;
Et ratio potius quam res persuadeat ipsa."

II.—THE FABLE OF PROMETHEUS.

EXPLAINED OF AN OVER-RULING PROVIDENCE, AND OF HUMAN NATURE.

THE ancients relate that man was the work of Prometheus, and formed of clay ; only the artificer mixed in with the mass particles taken from different animals. And being desirous to improve his workmanship, and endow, as well as create, the human race, he stole up to heaven with a bundle of birch-rods, and kindling them at the chariot of the Sun, thence brought down fire to the earth for the service of men.

They add, that for this meritorious act Prometheus was repayed with ingratitude by mankind, so that, forming a conspiracy, they arraigned both him and his invention before Jupiter. But the matter was otherwise received than they imagined ; for the accusation proved extremely grateful to Jupiter and the gods, insomuch that, delighted with the action, they not only indulged mankind the use of fire, but moreover conferred upon them a most acceptable and desirable present, viz., perpetual youth.

But men, foolishly overjoyed hereat, laid this present of the gods upon an ass, who, in returning back with it, being extremely thirsty, strayed to a fountain. The serpent, who was guardian thereof, would not suffer him to drink, but upon condition of receiving the burden he carried, whatever it should be. The silly ass complied, and thus the perpetual renewal of youth was, for a drop of water, transferred from men to the race of serpents.

Prometheus, not desisting from his unwarrantable practices, though now reconciled to mankind, after they were thus tricked of their present, but still continuing inveterate against Jupiter, had the boldness to attempt deceit, even in a sacrifice, and is said to have once offered up two bulls to Jupiter, but so as in the hide of one of them to wrap all the flesh and fat of both, and stuffing out the other hide only with the bones ; then in a religious and devout manner gave Jupiter his choice of the two. Jupiter, detesting this sly fraud and hypocrisy, but having thus an opportunity of punishing the offender, purposely chose the mock bull.

And now giving way to revenge, but finding he could not chastise the insolence of Prometheus without afflicting the human race (in the production whereof Prometheus had strangely and insufferably prided himself), he commanded Vulcan to form a beautiful and graceful woman, to whom every god presented a certain gift, whence she was called Pandora.* They put into her hands an elegant box, containing all sorts of miseries and misfortunes ; but Hope was placed at the bottom of it. With this box she first goes to Prometheus, to try if she could prevail upon him to receive and open it ; but he, being

* As if it were all gift.

upon his guard, warily refused the offer. Upon this refusal she comes to his brother Epimetheus, a man of a very different temper, who rashly and inconsiderately opens the box. When finding all kinds of miseries and misfortunes issued out of it, he grew wise too late, and with great hurry and struggle endeavoured to clap the cover on again ; but with all his endeavour could scarce keep in Hope, which lay at the bottom.

Lastly, Jupiter arraigned Prometheus of many heinous crimes : as that he formerly stole fire from heaven ; that he contemptuously and deceitfully mocked him by a sacrifice of bones ; that he despised his present,* adding withal a new crime, that he attempted to ravish Pallas : for all which, he was sentenced to be bound in chains, and doomed to perpetual torments. Accordingly, by Jupiter's command, he was brought to Mount Caucasus, and there fastened to a pillar, so firmly that he could no way stir. A vulture or eagle stood by him, which in the daytime gnawed and consumed his liver ; but in the night the wasted parts were supplied again ; whence matter for his pain was never wanting.

They relate, however, that his punishment had an end ; for Hercules sailing the ocean, in a cup, or pitcher, presented him by the Sun, came at length to Caucasus, shot the eagle with his arrows, and set Prometheus free. In certain nations, also, there were instituted particular games of the torch, to the honour of Prometheus, in which they who ran for the prize carried lighted torches ; and as any one of these torches happened to go out, the bearer withdrew himself, and gave way to the next ; and that person was allowed to win the prize who first brought in his lighted torch to the goal.

EXPLANATION.—This fable contains and enforces many just and serious considerations ; some whereof have been long since well observed, but some again remain perfectly untouched. Prometheus clearly and expressly signifies Providence ; for of all the things in nature, the formation and endowment of man was singled out by the ancients, and esteemed the peculiar work of Providence. The reason hereof seems, 1. That the nature of man includes a mind and understanding, which is the seat of Providence. 2. That it is harsh and incredible to suppose reason and mind should be raised, and drawn out of senseless and irrational principles ; whence it becomes almost inevitable, that providence is implanted in the human mind in conformity with, and by the direction and the design of the greater overruling Providence. But, 3. The principal cause is this : that man seems to be the thing in which the whole world centres, with respect to final causes ; so that if he were away, all other things would stray and fluctuate, without end or intention, or become perfectly disjointed, and out of frame ; for all things are made subservient to man, and he receives use and benefit from them all. Thus the revolutions, places, and periods, of the celestial bodies, serve him for distinguishing times

* Viz., that by Pandora.

and seasons, and for dividing the world into different regions; the meteors afford him prognostications of the weather; the winds sail our ships, drive our mills, and move our machines; and the vegetables and animals of all kinds either afford us matter for houses and habitations, clothing, food, physic, or tend to ease, or delight, to support, or refresh us: so that everything in nature seems not made for itself, but for man.

And it is not without reason added, that the mass of matter whereof man was formed, should be mixed up with particles taken from different animals, and wrought in with the clay, because it is certain, that of all things in the universe, man is the most compounded and recomposed body; so that the ancients not improperly styled him a Microcosm, or little world within himself. For although the chemists have absurdly, and too literally, wrested and perverted the elegance of the term microcosm, whilst they pretend to find all kind of mineral and vegetable matters, or something corresponding to them, in man, yet it remains firm and unshaken, that the human body is of all substances the most mixed and organical; whence it has surprising powers and faculties: for the powers of simple bodies are but few, though certain and quick; as being little broken, or weakened, and not counterbalanced by mixture: but excellence and quantity of energy reside in mixture and composition.

Man, however, in his first origin, seems to be a defenceless naked creature, slow in assisting himself, and standing in need of numerous things. Prometheus, therefore, hastened to the invention of fire, which supplies and administers to nearly all human uses and necessities, insomuch that, if the soul may be called the form of forms, if the Land may be called the instrument of instruments, fire may, as properly, be called the assistant of assistants, or the helper of helps; for hence proceed numberless operations, hence all the mechanic arts, and hence infinite assistances are afforded to the sciences themselves.

The manner wherein Prometheus stole this fire is properly described from the nature of the thing; he being said to have done it by applying a rod of birch to the chariot of the Sun: for birch is used in striking and beating, which clearly denotes the generation of fire to be from the violent percussions and collisions of bodies; whereby the matters struck are subtilized, rarefied, put into motion, and so prepared to receive the heat of the celestial bodies; whence they, in a clandestine and secret manner, collect and snatch fire, as it were by stealth, from the chariot of the Sun.

The next is a remarkable part of the fable, which represents that men, instead of gratitude and thanks, fell into indignation and expostulation, accusing both Prometheus and his fire to Jupiter,—and yet the accusation proved highly pleasing to Jupiter; so that he, for this reason, crowned these benefits of mankind with a new bounty. Here it may seem strange that the sin of ingratitude to a creator and benefactor, a sin so heinous as to include almost all others, should meet with approbation and reward. But the allegory has another view, and denotes, that the accusation and arraignment, both of human nature

and human art among mankind, proceeds from a most noble and laudable temper of the mind, and tends to a very good purpose; whereas the contrary temper is odious to the gods, and unbeneficial in itself. For they who break into extravagant praises of human nature, and the arts in vogue, and who lay themselves out in admiring the things they already possess, and will needs have the sciences cultivated among them, to be thought absolutely perfect and complete, in the first place, show little regard to the divine nature, whilst they extol their own inventions almost as high as his perfection. In the next place, men of this temper are unserviceable and prejudicial in life, whilst they imagine themselves already got to the top of things, and there rest, without farther inquiry. On the contrary, they who arraign and accuse both nature and art, and are always full of complaints against them, not only preserve a more just and modest sense of mind, but are also perpetually stirred up to fresh industry and new discoveries. Is not, then, the ignorance and fatality of mankind to be extremely pitied, whilst they remain slaves to the arrogance of a few of their own fellows, and are dotingly fond of that scrap of Grecian knowledge, the Peripatetic philosophy; and this to such a degree, as not only to think all accusation or arraignment thereof useless, but even hold it suspect and dangerous? Certainly the procedure of Empedocles, though furious—but especially that of Democritus (who with great modesty complained that all things were abstruse; that we know nothing; that truth lies hid in deep pits; that falsehood is strangely joined and twisted along with truth, &c.)—is to be preferred before the confident, assuming, and dogmatical school of Aristotle. Mankind are, therefore, to be admonished, that the arraignment of nature and of art is pleasing to the gods; and that a sharp and vehement accusation of Prometheus, though a creator, a founder, and a master, obtained new blessings and presents from the divine bounty, and proved more sound and serviceable than a diffusive harangue of praise and gratulation. And let men be assured, that the fond opinion that they have already acquired enough, is a principal reason why they have acquired so little.

That the perpetual flower of youth should be the present which mankind received as a reward for their accusation, carries this moral: that the ancients seem not to have despaired of discovering methods, and remedies, for retarding old age, and prolonging the period of human life, but rather reckoned it among those things which, through sloth and want of diligent inquiry, perish and come to nothing, after having been once undertaken, than among such as are absolutely impossible, or placed beyond the reach of the human power. For they signify and intimate from the true use of fire, and the just and strenuous accusation and conviction of the errors of art, that the divine bounty is not wanting to men in such kind of presents, but that men indeed are wanting to themselves, and lay such an inestimable gift upon the back of a slow-paced ass; that is, upon the back of the heavy, dull, lingering thing, experience; from whose sluggish and tortoise-pace proceeds that ancient complaint of the shortness of life, and the

slow advancement of arts. And certainly it may well seem, that the two faculties of reasoning and experience are not hitherto properly joined and coupled together, but to be still new gifts of the gods, separately laid, the one upon the back of a light bird, or abstract philosophy, and the other upon an ass, or slow-paced practice and trial. And yet good hopes might be conceived of this ass, if it were not for his thirst and the accidents of the way. For we judge, that if any one would constantly proceed, by a certain law and method, in the road of experience, and not by the way thirst after rich experiments, as make for profit or ostentation, nor exchange his burden, or quit the original design for the sake of these, he might be an useful bearer of a new and accumulated divine bounty to mankind.

That this gift of perpetual youth should pass from men to serpents, seems added by way of ornament, and illustration to the fable; perhaps intimating, at the same time, the shame it is for men, that they with their fire, and numerous arts, cannot procure to themselves the things which nature has bestowed upon many other creatures.

The sudden reconciliation of Prometheus to mankind, after being disappointed of their hopes, contains a prudent and useful admonition. It points out the levity and temerity of men in new experiments, when, not presently succeeding, or answering to expectation, they precipitantly quit their new undertakings, hurry back to their old ones, and grow reconciled thereto.

After the fable has described the state of man, with regard to arts and intellectual matters, it passes on to religion; for after the inventing and settling of arts, follows the establishment of divine worship, which hypocrisy presently enters into and corrupts. So that by the two sacrifices we have elegantly painted the person of a man truly religious, and of an hypocrite. One of these sacrifices contained the fat, or the portion of God, used for burning and incensing; thereby denoting affection and zeal, offered up to his glory. It likewise contained the bowels, which are expressive of charity, along with the good and useful flesh. But the other contained nothing more than dry bones, which nevertheless stuffed out the hide, so as to make it resemble a fair, beautiful, and magnificent sacrifice; hereby finely denoting the external and empty rites and barren ceremonies, wherewith men burden and stuff out the divine worship,—things rather intended for show and ostentation than conducing to piety:—Nor are mankind simply content with this mock-worship of God, but also impose and father it upon him, as if he had chosen and ordained it. Certainly the prophet, in the person of God, has a fine expostulation, as to this matter of choice:—"Is this the fasting which I have chosen, that a man should afflict his soul for a day, and bow down his head like a bulrush?"

After thus touching the state of religion, the fable next turns to manners, and the conditions of human life. And though it be a very common, yet is it a just interpretation, that Pandora denotes the pleasures and licentiousness which the cultivation and luxury of the arts of civil life introduce, as it were, by the instrumental efficacy of fire; whence the work of the voluptuary arts are properly attributed to

Vulcan, the God of Fire. And hence infinite miseries and calamities have proceeded to the minds, the bodies, and the fortunes of men, together with a late repentance; and this not only in each man's particular, but also in kingdoms and states; for wars, and tumults, and tyrannies, have all arisen from this same fountain, or box of Pandora.

It is worth observing, how beautifully and elegantly the fable has drawn two reigning characters in human life, and given two examples, or tablatures of them, under the persons of Prometheus and Epimetheus. The followers of Epimetheus are improvident, see not far before them, and prefer such things as are agreeable for the present; whence they are oppressed with numerous straits, difficulties, and calamities, with which they almost continually struggle; but in the mean time gratify their own temper, and, for want of a better knowledge of things, feed their minds with many vain hopes; and as with so many pleasing dreams, delight themselves, and sweeten the miseries of life.

But the followers of Prometheus are the prudent, wary men, that look into futurity, and cautiously guard against, prevent, and undermine many calamities and misfortunes. But this watchful, provident temper, is attended with a deprivation of numerous pleasures, and the loss of various delights, whilst such men debar themselves the use even of innocent things, and what is still worse, rack and torture themselves with cares, fears, and disquiets; being bound fast to the pillar of necessity, and tormented with numberless thoughts (which for their swiftness are well compared to an eagle), that continually wound, tear, and gnaw their liver or mind, unless, perhaps, they find some small remission by intervals, or as it were at nights; but then new anxieties, dreads, and fears, soon return again, as it were in the morning. And, therefore, very few men, of either temper, have secured to themselves the advantages of providence, and kept clear of disquiets, troubles, and misfortunes.

Nor indeed can any man obtain this end without the assistance of Hercules; that is, of such fortitude and constancy of mind as stands prepared against every event, and remains indifferent to every change; looking forward without being daunted, enjoying the good without disdain, and enduring the bad without impatience. And it must be observed, that even Prometheus had not the power to free himself, but owed his deliverance to another; for no natural inbred force and fortitude could prove equal to such a task. The power of releasing him came from the utmost confines of the ocean, and from the sun: that is, from Apollo, or knowledge; and again, from a due consideration of the uncertainty, instability, and fluctuating state of human life, which is aptly represented by sailing the ocean. Accordingly, Virgil has prudently joined these two together, accounting him happy who knows the causes of things, and has conquered all his fears, apprehensions, and superstitions.*

* "*Felix qui potuit rerum cognoscere causas,
Quique metus omnes et inexorabile fatum
Subjecit pedibus, strepitumque Acherontis avari.*"

It is added, with great elegance, for supporting and confirming the human mind, that the great hero who thus delivered him sailed the ocean in a cup, or pitcher, to prevent fear, or complaint; as if, through the narrowness of our nature, or a too great fragility thereof, we were absolutely incapable of that fortitude and constancy to which Seneca finely alludes, when he says, "It is a noble thing, at once to participate in the frailty of man and the security of a god."

We have hitherto, that we might not break the connection of things, designedly omitted the last crime of Prometheus—that of attempting the chastity of Minerva—which heinous offence it doubtless was, that caused the punishment of having his liver gnawed by the vulture. The meaning seems to be this,—that when men are puffed up with arts and knowledge, they often try to subdue even the divine wisdom and bring it under the dominion of sense and reason, whence inevitably follows a perpetual and restless rending and tearing of the mind. A sober and humble distinction must, therefore, be made betwixt divine and human things, and betwixt the oracles of sense and faith, unless mankind had rather choose an heretical religion, and a fictitious and romantic philosophy.*

The last particular in the fable is the Games of the Torch, instituted to Prometheus, which again relates to arts and sciences, as well as the invention of fire, for the commemoration and celebration whereof these games were held. And here we have an extremely prudent admonition, directing us to expect the perfection of the sciences from succession, and not from the swiftness and abilities of any single person; for he who is fleetest and strongest in the course may perhaps be less fit to keep his torch a-light, since there is danger of its going out from too rapid as well as from too slow a motion. But this kind of contest, with the torch, seems to have been long dropped and neglected; the sciences appearing to have flourished principally in their first authors, as Aristotle, Galen, Euclid, Ptolemy, &c.; whilst their successors have done very little, or scarce made any attempts. But it were highly to be wished that these games might be renewed, to the honour of Prometheus, or human nature, and that they might excite contest, emulation, and laudable endeavours, and the design meet with such success as not to hang tottering, tremulous, and hazarded, upon the torch of any single person. Mankind, therefore, should be admonished to rouse themselves, and try and exert their own strength and chance, and not place all their dependence upon a few men, whose abilities and capacities, perhaps, are not greater than their own.

These are the particulars which appear to us shadowed out by this trite and vulgar fable, though without denying that there may be contained in it several intimations that have a surprising correspondence with the Christian mysteries. In particular, the voyage of Hercules, made in a pitcher, to release Prometheus, bears an allusion

* See, *De Augmentis Scientiarum*, sec. xxviii. and suppl. xv.

to the word of God, coming in the frail vessel of the flesh to redeem mankind. But we indulge ourselves no such liberties as these, for fear of using strange fire at the altar of the Lord.

III.—THE FABLE OF ORPHEUS.

EXPLAINED OF NATURAL AND MORAL PHILOSOPHY.

INTRODUCTION.—The fable of Orpheus, though trite and common, has never been well interpreted, and seems to hold out a picture of universal philosophy; for to this sense may be easily transferred what is said of his being a wonderful and perfectly divine person, skilled in all kinds of harmony, subduing and drawing all things after him by sweet and gentle methods and modulations. For the labours of Orpheus exceed the labours of Hercules, both in power and dignity, as the works of knowledge exceed the works of strength.

FABLE.—Orpheus having his beloved wife snatched from him by sudden death, resolved upon descending to the infernal regions, to try if, by the power of his harp, he could reobtain her. And, in effect, he so appeased and soothed the infernal powers by the melody and sweetness of his harp and voice, that they indulged him the liberty of taking her back, on condition that she should follow him behind, and he not turn to look upon her till they came into open day; but he, through the impatience of his care and affection, and thinking himself almost past danger, at length looked behind him, whereby the condition was violated, and she again precipitated to Pluto's regions. From this time Orpheus grew pensive and sad, a hater of the sex, and went into solitude, where, by the same sweetness of his harp and voice, he first drew the wild beasts of all sorts about him; so that, forgetting their natures, they were neither actuated by revenge, cruelty, lust, hunger, or the desire of prey, but stood gazing about him in a tame and gentle manner, listening attentively to his music. Nay, so great was the power and efficacy of his harmony, that it even caused the trees and stones to remove, and place themselves in a regular manner about him. When he had for a time, and with great admiration, continued to do this, at length the Thracian women, raised by the instigation of Bacchus, first blew a deep and hoarse-sounding horn in such an outrageous manner, that it quite drowned the music of Orpheus. And thus the power which, as the link of their society, held all things in order, being dissolved, disturbance reigned anew; each creature returned to its own nature, and pursued and preyed upon its fellow, as before. The rocks and woods also started back to their former places; and even Orpheus himself was at last torn to pieces by these female furies, and

his limbs scattered all over the desert. But in sorrow and revenge for his death, the river Helicon, sacred to the Muses, hid its water under ground, and rose again in other places.

EXPLANATION.—The fable receives this explanation. The music of Orpheus is of two kinds ; one that appeases the infernal powers, and the other that draws together the wild beasts and trees. The former properly relates to natural, and the latter to moral, philosophy, or civil society. The reinstatement and restoration of corruptible things is the noblest work of natural philosophy ; and, in a less degree, the preservation of bodies in their own state, or a prevention of their dissolution and corruption. And if this be possible, it can certainly be effected no other way than by proper and exquisite attemperations of nature ; as it were by the harmony and fine touching of the harp. But as this is a thing of exceeding great difficulty, the end is seldom obtained ; and that, probably, for no reason more than a curious and unseasonable impatience and solicitude.

And, therefore, philosophy being almost unequal to the task, has cause to grow sad, and hence betakes itself to human affairs, insinuating into men's minds the love of virtue, equity, and peace, by means of eloquence and persuasion ; thus forming men into societies, bringing them under laws and regulations, and making them forget their unbridled passions and affections, so long as they hearken to precepts and submit to discipline. And thus they soon after build themselves habitations, form cities, cultivate lands, plant orchards, gardens, etc. So that they may not improperly be said to remove and call the trees and stones together.

And this regard to civil affairs is justly and regularly placed after diligent trial made for restoring the mortal body ; the attempt being frustrated in the end, because the unavoidable necessity of death, thus evidently laid before mankind, animates them to seek a kind of eternity by works of perpetuity, character, and fame.

It is also prudently added, that Orpheus was afterwards averse to women and wedlock, because the indulgence of a married state, and the natural affections which men have for their children, often prevent them from entering upon any grand, noble, or meritorious enterprise for the public good ; as thinking it sufficient to obtain immortality by their descendants, without endeavouring at great actions.

And even the works of knowledge, though the most excellent among human things, have their periods ; for after kingdoms and commonwealths have flourished for a time, disturbances, seditions, and wars often arise, in the din whereof, first the laws are silent, and not heard ; and then men return to their own depraved natures, whence cultivated lands and cities soon become desolate and waste. And if this disorder continues, learning and philosophy is infallibly torn to pieces ; so that only some scattered fragments thereof can afterwards be found up and down, in a few places, like planks after a shipwreck. And barbarous times succeeding, the river Helicon dips under-ground ; that is, letters are buried, till things having undergone their due course

of changes, learning rises again, and shows its head, though seldom in the same place, but in some other nation.^o

IV.—THE FABLE OF ATALANTA AND HIPPOMENES.

EXPLAINED OF THE CONTEST BETWIXT ART AND NATURE.

ATALANTA, who was exceeding fleet, contended with Hippomenes in the course, on condition that if Hippomenes won, he should espouse her, or forfeit his life if he lost. The match was very unequal, for Atalanta had conquered numbers, to their destruction. Hippomenes, therefore, had recourse to stratagem. He procured three golden apples, and purposely carried them with him : they started ; Atalanta outstripped him soon ; then Hippomenes bowled one of his apples before her, across the course, in order not only to make her stoop, but to draw her out of the path. She, prompted by female curiosity, and the beauty of the golden fruit, starts from the course to take up the apple. Hippomenes, in the mean time, holds on his way, and steps before her ; but she, by her natural swiftness, soon fetches up her lost ground, and leaves him again behind. Hippomenes, however, by rightly timing his second and third throw, at length won the race, not by his swiftness, but his cunning.

EXPLANATION.—This fable seems to contain a noble allegory of the contest betwixt art and nature. For art, here denoted by Atalanta, is much swifter, or more expeditious in its operations than nature, when all obstacles and impediments are removed, and sooner arrives at its end. This appears almost in every instance. Thus fruit comes slowly from the kernel, but soon by inoculation or incision ; clay, left to itself, is a long time acquiring a stony hardness, but is presently burnt by fire into brick.† So again in human life, nature is a long while in alleviating and abolishing the remembrance of pain, and assuaging the troubles of the mind ; but moral philosophy, which is the art of living, performs it presently. Yet this prerogative and singular efficacy of art is stopped and retarded to the infinite detriment of human life, by certain golden apples ; for there is no one science or art that constantly holds on its true and proper course to the end, but they are all continually stopping short, forsaking the track, and turning aside to profit and convenience, exactly like Atalanta. Whence it is

* Thus we see that Orpheus denotes learning ; Eurydice, things, or the subject of learning ; Bacchus, and the Thracian women, men's ungoverned passions and appetites, etc. And in the same manner these fables might be familiarly illustrated and brought down to the capacities of children, who usually learn them in an unscientific manner at school.

† A proper collection of these instances should be made for the encouragement of men in their endeavours to advance arts and produce considerable effects.

no wonder that art gets not the victory over nature, nor, according to the condition of the contest, brings her under subjection ; but, on the contrary, remains subject to her, as a wife to a husband.*

V.—THE FABLE OF ERICTHONIUS.

EXPLAINED OF THE IMPROPER USE OF FORCE IN NATURAL PHILOSOPHY.

THE poets feign that Vulcan attempted the chastity of Minerva, and impatient of refusal, had recourse to force ; the consequence of which was the birth of Ericthonius, whose body from the middle upwards was comely and well-proportioned, but his thighs and legs small, shrunk, and deformed, like an eel. Conscious of this defect, he became the inventor of chariots, so as to show the graceful, but conceal the deformed part of his body.

EXPLANATION.—This strange fable seems to carry this meaning. Art is here represented under the person of Vulcan, by reason of the various uses it makes of fire ; and nature under the person of Minerva, by reason of the industry employed in her works. Art, therefore, whenever it offers violence to nature, in order to conquer, subdue, and bend her to its purpose, by tortures and force of all kinds, seldom obtains the end proposed ; yet upon great struggle and application, there proceed certain imperfect births, or lame abortive works, specious in appearance, but weak and unstable in use ; which are, nevertheless, with great pomp and deceitful appearances, triumphantly carried about, and shown by impostors. A procedure very familiar, and remarkable in chemical productions, and new mechanical inventions ; especially when the inventors rather hug their errors than improve upon them, and go on struggling with nature, not courting her.

* The author, in all his physical works, proceeds upon this foundation, that it is possible, and practicable, for art to obtain the victory over nature ; that is, for human industry and power to procure, by the means of proper knowledge, such things as are necessary to render life as happy and commodious as its mortal state will allow. For instance, that it is possible to lengthen the present period of human life ; bring the winds under command ; and every way extend and enlarge the dominion or empire of man over the works of nature ; and let no one fearfully apprehend that there is danger in this endeavouring to take the reins of government out of nature's hands, and putting them into the weak hands of men, for the distinction between men and nature is imaginary, and only made to help the understanding : man himself being necessarily subject to the laws of nature ; though within the compass of these laws he has a very extensive power that will always be commensurate to knowledge.

VI.—THE FABLE OF ICARUS, AND THAT OF SCYLLA AND CHARYBDIS.

EXPLAINED OF MEDIOCRITY IN NATURAL AND MORAL PHILOSOPHY.

MEDIOCRITY, or the holding a middle course, has been highly extolled in morality, but little in matters of science, though no less useful and proper here; whilst in politics it is held suspected, and ought to be employed with judgment. The ancients described mediocrity in manners by the course prescribed to Icarus; and in matters of the understanding by the steering betwixt Scylla and Charybdis, on account of the great difficulty and danger of passing those straits.

Icarus, being to fly across the sea, was ordered by his father neither to soar too high nor fly too low, for, as his wings were fastened together with wax, there was danger of its melting by the sun's heat in too high a flight, and of its becoming less tenacious by the moisture if he kept too near the vapour of the sea. But he, with a juvenile confidence, soared aloft, and fell down headlong.

EXPLANATION.—The fable is vulgar, and easily interpreted; for the path of virtue lies straight between excess on the one side, and defect on the other. And no wonder that excess should prove the bane of Icarus, exulting in juvenile strength and vigour; for excess is the natural vice of youth, as defect is that of old age; and if a man must perish by either, Icarus chose the better of the two; for all defects are justly esteemed more depraved than excesses. There is some magnanimity in excess, that, like a bird, claims kindred with the heavens; but defect is a reptile, that basely crawls upon the earth. It was excellently said by Heraclitus, "A dry light makes the best soul;" for if the soul contracts moisture from the earth, it perfectly degenerates and sinks. On the other hand, moderation must be observed, to prevent this fine light from burning, by its too great subtilty and dryness. But these observations are common.

In matters of the understanding, it requires great skill and a particular felicity to steer clear of Scylla and Charybdis. If the ship strikes upon Scylla, it is dashed in pieces against the rocks; if upon Charybdis, it is swallowed outright. This allegory is pregnant with matter; but we shall only observe the force of it lies here, that a mean be observed in every doctrine and science, and in the rules and axioms thereof, between the rocks of distinctions and the whirlpools of universalities; for these two are the bane and shipwreck of fine genius and arts.

VII.—THE FABLE OF PROTEUS.

EXPLAINED OF MATTER AND ITS CHANGES.

PROTEUS, according to the poets, was Neptune's herdsman ; an old man, and a most extraordinary prophet, who understood things past and present, as well as future ; so that besides the business of divination, he was the revealer and interpreter of all antiquity, and secrets of every kind. He lived in a vast cave, where his custom was to tell over his herd of sea-calves at noon, and then to sleep. Whoever consulted him, had no other way of obtaining an answer, but by binding him with manacles and fetters ; when he, endeavouring to free himself, would change into all kinds of shapes and miraculous forms ; as of fire, water, wild beasts, &c. ; till at length he resumed his own shape again.

EXPLANATION.—This fable seems to point at the secrets of nature, and the states of matter. For the person of Proteus denotes matter, the oldest of all things, after God himself ; * that resides, as in a cave, under the vast concavity of the heavens. He is represented as the servant of Neptune, because the various operations and modifications of matter are principally wrought in a fluid state. The herd, or flock of Proteus, seems to be no other than the several kinds of animals, plants, and minerals, in which matter appears to diffuse and spend itself ; so that after having formed these several species, and as it were finished its task, it seems to sleep and repose, without otherwise attempting to produce any new ones. And this is the moral of Proteus ; counting his herd, then going to sleep.

This is said to be done at noon, not in the morning or evening ; by which is meant the time best fitted and disposed for the production of species, from a matter duly prepared, and made ready beforehand, and now lying in a middle state, between its first rudiments and decline ; which, we learn from sacred history, was the case at the time of the creation ; when by the efficacy of the divine command, matter directly came together, without any transformation or intermediate changes, which it affects ; instantly obeyed the order, and appeared in the form of creatures.

And thus far the fable reaches of Proteus, and his flock, at liberty and unrestrained. For the universe, with the common structures and fabrics of the creatures, is the face of matter, not under constraint, or as the flock wrought upon and tortured by human means. But if any skilful minister of nature shall apply force to matter, and by design torture and vex it, in order to its annihilation, it, on the contrary, being brought under this necessity, changes and transforms itself into a strange variety of shapes and appearances ; for nothing but the

* Proteus properly signifies primary, oldest, or first.

power of the Creator can annihilate, or truly destroy it ; so that at length, running through the whole circle of transformations, and completing its period, it in some degree restores itself, if the force be continued. And that method of binding, torturing, or detaining, will prove the most effectual and expeditious, which makes use of manacles and fetters ; that is, lays hold and works upon matter in the extremest degrees.

The addition in the fable that makes a Proteus a prophet, who had the knowledge of things past, present, and future, excellently agrees with the nature of matter ; as he who knows the properties, the changes, and the processes of matter, must of necessity understand the effects and sum of what it does, has done, or can do, though his knowledge extends not to all the parts and particulars thereof.

VIII.—THE FABLE OF CUPID.

EXPLAINED OF THE CORPUSCULAR PHILOSOPHY.

THE particulars related by the poets of Cupid, or Love, do not properly agree to the same person ; yet they differ only so far, that if the confusion of persons be rejected, the correspondence may hold. They say that Love was the most ancient of all the gods, and existed before everything else, except Chaos, which is held coeval therewith. But for Chaos, the ancients never paid divine honours, nor gave the title of a god thereto. Love is represented absolutely without progenitor, excepting only that he is said to have proceeded from the egg of Nox ; but that himself begot the gods, and all things else on Chaos. His attributes are four : viz., 1. perpetual infancy ; 2. blindness ; 3. nakedness ; and 4. archery.

There was also another Cupid, or Love, the youngest son of the gods, born of Venus, and upon him the attributes of the elder are transferred, with some degree of correspondence.

EXPLANATION.—This fable points at, and enters, the cradle of nature. Love seems to be the appetite, or incentive, of the primitive matter ; or, to speak more distinctly, the natural motion, or moving principle, of the original corpuscles, or atoms ; this being the most ancient and only power that made and wrought all things out of matter. It is absolutely without parent, that is, without cause ; for causes are as parents to effects ; but this power or efficacy could have no natural cause ; for, excepting God, nothing was before it ; and therefore it could have no efficient in nature. And as nothing is more inward with nature, it can neither be a genus nor a form ; and therefore, whatever it is, it must be somewhat positive, though inexpressible. And if it were possible to conceive its modus and process, yet it could not

be known from its cause, as being, next to God, the cause of causes, and itself without a cause. And perhaps we are not to hope that the *modus* of it should fall, or be comprehended, under human inquiry. Whence it is properly feigned to be the egg of Nox, or laid in the dark.

The divine philosopher declares, that "God has made everything beautiful in its season; and has given over the world to our disputes and inquiries; but that man cannot find out the work which God has wrought, from its beginning up to its end." Thus the summary or collective law or nature, or the principle of love, impressed by God upon the original particles of all things, so as to make them attack each other and come together, by the repetition and multiplication whereof all the variety in the universe is produced, can scarce possibly find full admittance in the thoughts of men, though some faint notion may be had thereof. The Greek philosophy is subtle, and busied in discovering the material principles of things, but negligent and languid in discovering the principles of motion, in which the energy and efficacy of every operation consists. And here the Greek philosophers seem perfectly blind and childish; for the opinion of the Peripatetics, as to the stimulus of matter, by privation, is little more than words, or rather sound than signification. And they who refer it to God, though they do well therein, yet they do it by a start, and not by proper degrees of assent; for doubtless there is one summary, or capital law, in which nature meets, subordinate to God, viz., the law mentioned in the passage above quoted from Solomon; or the work which God has wrought from its beginning up to its end.

Democritus, who farther considered this subject, having first supposed an atom, or corpuscle, of some dimension or figure, attributed thereto an appetite, desire, or first motion simply, and another comparatively, imagining that all things properly tended to the centre of the world; those containing more matter falling faster to the centre, and thereby removing, and in the shock driving away, such as held fast. But this is a slender conceit, and regards too few particulars; for neither the revolutions of the celestial bodies, nor the contractions and expansions of things, can be reduced to this principle. And for the opinion of Epicurus, as to the declination and fortuitous agitation of atoms, this only brings the matter back again to a trifle, and wraps it up in ignorance and night.

Cupid is elegantly drawn a perpetual child; for compounds are larger things, and have their periods of age; but the first seeds or atoms of bodies are small, and remain in a perpetual infant state.

He is again justly represented naked; as all compounds may properly be said to be dressed and clothed, or to assume a personage; whence nothing remains truly naked, but the original particles of things.

The blindness of Cupid contains a deep allegory; for this same Cupid, Love, or appetite of the world, seems to have very little foresight, but directs his steps and motions conformably to what he finds next him, as blind men do when they feel out their way; which

renders the divine and over-ruling Providence and foresight the more surprising; as by a certain steady law, it brings such a beautiful order and regularity of things out of what seems extremely casual, void of design, and, as it were, really blind.

The last attribute of Cupid is archery, viz., a virtue or power operating at a distance; for everything that operates at a distance, may seem, as it were, to dart, or shoot with arrows. And whoever allows of atoms and vacuity, necessarily supposes that the virtue of atoms operates at a distance; for without this operation no motion could be excited, on account of the vacuum interposing, but all things would remain sluggish and unmoved.

As to the other Cupid, he is properly said to be the youngest sons of the gods, as his power could not take place before the formation of species, or particular bodies. The description given us of him transfers the allegory to morality, though he still retains some resemblance with the ancient Cupid; for as Venus universally excites the affection of association, and the desire of procreation, her son Cupid applies the affection to individuals; so that the general disposition proceeds from Venus, but the more close sympathy from Cupid. The former depends upon a near approximation of causes, but the latter upon deeper, more necessitating and uncontrollable principles, as if they proceeded from the ancient Cupid, on whom all exquisite sympathies depend.

IX.—THE FABLE OF DEUCALION.

EXPLAINED OF A USEFUL HINT IN NATURAL PHILOSOPHY.

THE poets tell us that the inhabitants of the old world being totally destroyed, by the universal deluge, excepting Deucalion and Pyrrha, these two, desiring with zealous and fervent devotion to restore mankind, received this oracle for answer, that “they should succeed by throwing their mother’s bones behind them.” This at first cast them into great sorrow and despair, because, as all things were levelled by the deluge, it was in vain to seek their mother’s tomb; but at length they understood the expression of the oracle to signify the stones of the earth, which is esteemed the mother of all things.

EXPLANATION.—This fable seems to reveal a secret of nature, and correct an error familiar to the mind; for men’s ignorance leads them to expect the renovation or restoration of things from their corruption and remains, as the phoenix is said to be restored out of its ashes; which is a very improper procedure, because such kind of materials have finished their course, and are become absolutely unfit to supply the first rudiments of the same things again: whence, in cases of renovation, recourse should be had to more common principles.

X. THE FABLE OF SPHINX.

EXPLANED OF THE SCIENCE.

THEY relate that Sphinx was a monster, variously formed, having the face and voice of a virgin, the wings of a bird, and the talons of a python. She resided on the top of a mountain, near the city Thebes, and also beset the highways. Her manner was to lie in ambush, and seize the travellers, and having them in her power, to propose to them certain dark and perplexing riddles, which it was thought she received from the Muses, and if her wretched captives could not solve and interpret these riddles, she with great cruelty fell upon them, in their hesitation and confusion, and tore them to pieces. This practice having endured a long time, the Thebans at length offered their kingdom to the man who could interpret her riddles, there being no other way to subdue her. Oedipus, a penetrating and prudent man, though lame in his feet, excited by so great a reward, accepted the condition, and with a good assurance of mind, cheerfully presented himself before the monster, who directly asked him, "What creature that was, which being born four-footed, afterwards became two-footed, then three-footed and lastly four-footed again?" Oedipus, with presence of mind, replied it was man, who, upon his first birth and infant state, crawled upon all fours in endeavouring to walk; but not long after went upright upon his two natural feet; again, in old age walked three-footed, with a stick; and at last, growing decrepit, lay four-footed confined to his bed; and having by this exact solution obtained the victory, he slew the monster, and, laying the carcass upon an ass, led her away in triumph; and upon this he was, according to the agreement, made king of Thebes.

EXPLANATION.—This is an elegant, instructive fable, and seems invented to represent science, especially as joined with practice. For science may, without absurdity, be called a monster, being strangely gazed at and admired by the ignorant and unskilful. Her figure and form is various, by reason of the vast variety of subjects that science considers; her voice and countenance are represented female, by reason of her gay appearance and volubility of speech; wings are added, because the sciences and their inventions run and fly about in a moment, for knowledge, like light communicated from one torch to another, is presently caught and copiously diffused; sharp and hooked talons are elegantly attributed to her, because the axioms and arguments of science enter the mind, lay hold of it, fix it down, and keep it from moving or slipping away. Thus the sacred philosopher observe! when he said, "The words of the wise are like goads, or nails driven far in." Again, all science seems placed on high, as it were on the tops of mountains that are hard to climb; for science is justly imagined a sublime and lofty thing, looking down upon ignorance from an eminence, and at the same time taking an extensive view on

all sides, as is usual on the tops of mountains. Science is said to beset the highways, because through all the journey and peregrination of human life there is matter and occasion offered of contemplation.

Sphinx is said to propose various difficult questions and riddles to men, which she received from the Muses; and these questions, so long as they remain with the Muses, may very well be unaccompanied with severity, for while there is no other end of contemplation and inquiry, but that of knowledge alone, the understanding is not oppressed, or driven to straits and difficulties, but expatiates and ranges at large, and even receives a degree of pleasure from doubt and variety; but after the Muses have given over their riddles to Sphinx, that is, to practice, which urges and impels to action, choice, and determination, then it is that they become torturing, severe, and trying, and, unless solved and interpreted, strangely perplex and harass the human mind, rend it every way, and perfectly tear it to pieces. All the riddles of Sphinx, therefore, have two conditions annexed, viz., dilaceration to those who do not solve them, and empire to those that do. For he who understands the thing proposed obtains his end, and every artifice rules over his work.*

Sphinx has no more than two kinds of riddles, one relating to the nature of things, the other to the nature of man; and correspondent to these, the prizes of the solution are two kinds of empire,—the empire over nature, and the empire over man. For the true and ultimate end of natural philosophy is dominion over natural things, natural bodies, remedies, machines, and numberless other particulars, though the schools, contented with what spontaneously offers, and swollen with their own discourses, neglect, and in a manner despise, both things and works.

But the riddle proposed to Œdipus, the solution whereof acquired him the Theban kingdom, regarded the nature of man; for he who has thoroughly looked into and examined human nature, may in a manner command his own fortune, and seems born to acquire dominion and rule. Accordingly, Virgil properly makes the arts of government to be the arts of the Romans.† It was, therefore, extremely apposite in Augustus Cæsar to use the image of Sphinx in his signet, whether this happened by accident or by design; for he, of all men, was deeply versed in politics, and through the course of his life very happily solved abundance of new riddles with regard to the nature of man; and unless he had done this with great dexterity and ready address, he would frequently have been involved in imminent danger, if not destruction.

It is with the utmost elegance added in the fable, that when Sphinx

* This is what the author so frequently inculcates in the *Novum Organum*, viz., that knowledge and power are reciprocal; so that to improve in knowledge is to improve in the power of commanding nature, by introducing new arts, and producing works and effects.

† "Tu regere imperio populos, Romane, memento:
Hæ tibi erunt artes."—Æn. vi. 852.

was conquered, her carcass was laid upon an ass ; for there is nothing so subtle and abstruse, but after being once made plain, intelligible, and common, it may be received by the slowest capacity.

We must not omit that Sphinx was conquered by a lame man, and impotent in his feet ; for men usually make too much haste to the solution of Sphinx's riddles ; whence it happens, that she prevailing, their minds are rather racked and torn by disputes, than invested with command by works and effects.

XI.—THE FABLE OF PROSERPINE.

EXPLAINED OF THE SPIRIT INCLUDED IN NATURAL BODIES.

THEY tell us, Pluto having, upon that memorable division of empire among the gods, received the infernal regions for his share, despairing of winning any one of the goddesses in marriage by an obsequious courtship, and therefore through necessity resolved upon a rape. Having watched his opportunity, he suddenly seized upon Proserpine, a most beautiful virgin, the daughter of Ceres, as she was gathering narcissus flowers in the meads of Sicily, and hurrying her to his chariot, carried her with him to the subterranean regions, where she was treated with the highest reverence, and styled the Lady of Dis. But Ceres missing her only daughter, whom she extremely loved, grew pensive and anxious beyond measure, and taking a lighted torch in her hand, wandered the world over in quest of her daughter, —but all to no purpose, till, suspecting she might be carried to the infernal regions, she, with great lamentation and abundance of tears, importuned Jupiter to restore her ; and with much ado prevailed so far as to recover and bring her away, if she had tasted nothing there. This proved a hard condition upon the mother, for Proserpine was found to have eaten three kernels of a pomegranate. Ceres, however, desisted not, but fell to her entreaties and lamentations afresh, inasmuch that at last it was indulged her that Proserpine should divide the year betwixt her husband and her mother, and live six months with the one and as many with the other. After this Theseus and Perithous, with uncommon audacity, attempted to force Proserpine away from Pluto's bed, but happening to grow tired in their journey, and resting themselves upon a stone in the realms below, they could never rise from it again, but remain sitting there for ever. Proserpine, therefore, still continued queen of the lower regions, in honour of whom there was also added this grand privilege, that though it had never been permitted any one to return after having once descended thither, a particular exception was made, that he who brought a golden bough as a present to Proserpine, might on that condition descend and return. This was an only bough that grew in a large dark grove, not from a tree of its own, but like the mistletoe, from another, and when plucked away a fresh one always shot out in its stead.

EXPLANATION.—This fable seems to regard natural philosophy, and searches deep into that rich and fruitful virtue and supply in subterraneous bodies, from whence all the things upon the earth's surface spring, and into which they again relapse and return. By Proserpine the ancients denoted that ethereal spirit shut up and detained within the earth, here represented by Pluto,—the spirit being separated from the superior globe, according to the expression of the poet.* This spirit is conceived as ravished, or snatched up by the earth, because it can no way be detained, when it has time and opportunity to fly off, but is only wrought together and fixed by sudden intermixture, and comminution, in the same manner as if one should endeavour to mix air with water, which cannot otherwise be done than by a quick and rapid agitation, that joins them together in froth whilst the air is thus caught up by the water. And it is elegantly added, that Proserpine was ravished whilst she gathered narcissus flowers, which have their name from numbness, or stupefaction; for the spirit we speak of is in the fittest disposition to be embraced by terrestrial matter when it begins to coagulate, or grow torpid as it were.

It is an honour justly attributed to Proserpine, and not to any other wife of the gods, that of being the lady or mistress of her husband, because this spirit performs all its operations in the subterranean regions, whilst Pluto, or the earth, remains stupid, or as it were ignorant of them.

The æther, or the efficacy of the heavenly bodies, denoted by Ceres, endeavours with infinite diligence to force out this spirit, and restore it to its pristine state. And by the torch in the hand of Ceres, or the æther, is doubtless meant the sun, which disperses light over the whole globe of the earth, and if the thing were possible, must have the greatest share in recovering Proserpine, or reinstating the subterranean spirit. Yet Proserpine still continues and dwells below after the manner excellently described in the condition betwixt Jupiter and Ceres. For first, it is certain that there are two ways of detaining the spirit, in solid and terrestrial matter,—the one of condensation or obstruction, which is mere violence and imprisonment; the other by administering a proper aliment, which is spontaneous and free. For after the included spirit begins to feed and nourish itself, it is not in a hurry to fly off, but remains as it were fixed in its own earth. And this is the moral of Proserpine's tasting the pomegranate: and were it not for this, she must long ago have been carried up by Ceres, who with her torch wandered the world over, and so the earth have been left without its spirit. For though the spirit in metals and minerals may perhaps be, after a particular manner, wrought in by the solidity of the mass, yet the spirit of vegetables and animals has open passages to escape at, unless it be willingly detained, in the way of sipping and tasting them.

The second article of agreement, that of Proserpine's remaining six months with her mother and six with her husband, is an elegant

* "Sive recens tellus, seductaque nuper ab alta
Æthere, cognati retinebat semina cœli."—*Metam.* i. 80.

description of the division of the year ; for the spirit diffused through the earth lives above ground in the vegetable world during the summer months, but in the winter returns under ground again.

The attempt of Theseus and Perithous to bring Proserpine away, denotes that the more subtle spirits, which descend in many bodies to the earth, may frequently be unable to drink in, unite with themselves, and carry off the subterraneous spirit, but on the contrary be coagulated by it, and rise no more, so as to increase the inhabitants and add to the dominion of Proserpine.*

The alchemists will be apt to fall in with our interpretation of the golden bough, whether we will or no, because they promise golden mountains, and the restoration of natural bodies from their stone, as from the gates of Pluto ; but we are well assured that their theory has no just foundation, and suspect they have no very encouraging or practical proofs of its soundness. Leaving, therefore, their conceits to themselves, we shall freely declare our own sentiments upon this last part of the fable. We are certain, from numerous figures and expressions of the ancients, that they judged the conservation, and in some degree the renovation, of natural bodies to be no desperate or impossible thing, but rather abstruse and out of the common road than wholly impracticable, and this seems to be their opinion in the present case, as they have placed this bough among an infinite number of shrubs, in a spacious and thick wood. They supposed it of gold, because gold is the emblem of duration. They feigned it adventitious, not native, because such an effect is to be expected from art, and not from any medicine or any simple or mere natural way of working.

XII.—THE FABLE OF MEMNON.

EXPLAINED OF THE FATAL PRECIPITANCY OF YOUTH.

THE poets made Memnon the son of Aurora, and bring him to the Trojan war in beautiful armour, and flushed with popular praise ; where, thirsting after farther glory, and rashly hurrying on to the greatest enterprises, he engages the bravest warrior of all the Greeks, Achilles, and falls by his hand in single combat. Jupiter, in commiseration of his death, sent birds to grace his funeral, that perpetually chanted certain mournful and bewailing dirges. It is also reported, that the rays of the rising sun, striking his statue, used to give a lamenting sound.

EXPLANATION.—This fable regards the unfortunate end of those

* Many philosophers have certain speculations to this purpose. Sir Isaac Newton, in particular, suspects that the earth receives its vivifying spirits from the comets. And the philosophical chemists and astrologers have spun the thought into many fantastical distinctions and varieties. See Newton, Princip. lib. iii. p. 473. &c.

promising youths, who, like sons of the morning, elate with empty hopes and glittering outsides, attempt things beyond their strength: challenge the bravest heroes; provoke them to the combat; and proving unequal, die in their high attempts.

The death of such youths seldom fails to meet with infinite pity; as no mortal calamity is more moving and afflicting, than to see the flower of virtue cropped before its time. Nay, the prime of life enjoyed to the full, or even to a degree of envy, does not assuage or moderate the grief occasioned by the untimely death of such hopeful youths; but lamentations and bewailings fly, like mournful birds, about their tombs, for a long while after; especially upon all fresh occasions, new commotions, and the beginning of great actions, the passionate desire of them is renewed, as by the sun's morning rays.

XIII.—THE FABLE OF TYTHONUS.

EXPLAINED OF PREDOMINANT PASSIONS.

IT is elegantly fabled by Tythonus, that being exceedingly beloved by Aurora, she petitioned Jupiter that he might prove immortal, thereby to secure herself the everlasting enjoyment of his company; but through female inadvertence she forgot to add, that he might never grow old; so that, though he proved immortal, he became miserably worn and consumed with age, insomuch that Jupiter, out of pity, at length transformed him to a grasshopper.

EXPLANATION.—This fable seems to contain an ingenious description of pleasure; which at first, as it were in the morning of the day, is so welcome, that men pray to have it everlasting, but forget that satiety and weariness of it will, like old age, overtake them, though they think not of it; so that at length, when their appetite for pleasurable actions is gone, their desires and affections often continue; whence we commonly find that aged persons delight themselves with the discourse and remembrance of the things agreeable to them in their better days. This is very remarkable in men of a loose, and men of a military life; the former whereof are always talking over their amours, and the latter the exploits of their youth; like grasshoppers, that show their vigour only by their chirping.

XIV.—THE FABLE OF NARCISSUS.

EXPLAINED OF SELF-LOVE.

NARCISSUS is said to have been extremely beautiful and comely, but intolerably proud and disdainful; so that, pleased with himself, and scorning the world, he led a solitary life in the woods; hunting

only with a few followers, who were his professed admirers, amongst whom the nymph Echo was his constant attendant. In this method of life it was once his fate to approach a clear fountain, where he laid himself down to rest, in the noonday heat; when, beholding his image in the water, he fell into such a rapture and admiration of himself, that he could by no means be got away, but remained continually fixed and gazing, till at length he was turned into a flower, of his own name, which appears early in the spring, and is consecrated to the infernal deities, Pluto, Proserpine, and the Furies.

EXPLANATION. This fable seems to paint the behaviour and fortune of those, who, for their beauty, or other endowments, where-with nature (without any industry of their own) has graced and adorned them, are extravagantly fond of themselves: for men of such a disposition generally affect retirement, and absence from public affairs; as a life of business must necessarily subject them to many neglects and contempts, which might disturb and ruffle their minds: whence such persons commonly lead a solitary, private, and shadowy life; see little company, and those only such as highly admire and reverence them; or, like an echo, assent to all they say.

And they who are depraved, and rendered still fonder of themselves by this custom, grow strangely indolent, unactive, and perfectly stupid. The Narcissus, a spring flower, is an elegant emblem of this temper, which at first flourishes, and is talked of, but when ripe, frustrates the expectation conceived of it.

And that this flower should be sacred to the infernal powers, carries out the allusion still farther; because men of this humour are perfectly useless in all respects: for whatever yields no fruit, but passes, and is no more, like the way of a ship in the sea, was by the ancients consecrated to the infernal shades and powers.

XV. -THE FABLE OF JUNO'S COURTSHIP.

EXPLAINED OF SUBMISSION AND ABJECTION.

THE poets tell us, that Jupiter, to carry on his love intrigues, assumed many different shapes; as of a bull, an eagle, a swan, a golden shower, etc.; but when he attempted Juno, he turned himself into the most ignoble and ridiculous creature,—even that of a wretched, wet, weather-beaten, affrighted, trembling, and half-starved cuckoo.

EXPLANATION.—This is a wise fable, and drawn from the very entrails of morality. The moral is, that men should not be conceited of themselves, and imagine that a discovery of their excellences will always render them acceptable; for this can only succeed according

to the nature and manners of the person the court, or solicit ; who, if he be a man not of the same gifts and endowments, but altogether of a haughty and contemptuous behaviour, here represented by the person of Juno, they must entirely drop the character that carries the least show of worth, or gracefulness ; if they proceed upon any other footing, it is downright folly ; nor is it sufficient to act the deformity of obsequiousness, unless they really change themselves, and become abject and contemptible in their persons.

XVI.—THE FABLE OF CASSANDRA.

EXPLAINED OF TOO FREE AND UNSEASONABLE ADVICE.

THE poets relate, that Apollo, falling in love with Cassandra, was still deluded and put off by her, yet fed with hopes, till she had got from him the gift of prophecy ; and having now obtained her end, she flatly rejected his suit. Apollo, unable to recall his rash gift, yet enraged to be outwitted by a girl, annexed this penalty to it, that though she should always prophesy true, she should never be believed ; whence her divinations were always slighted, even when she again and again predicted the ruin of her country.

EXPLANATION.—This fable seems invented to express the insignificance of unseasonable advice. For they who are conceited, stubborn, or intractable, and listen not to the instructions of Apollo, the god of harmony, so as to learn and observe the modulations and measures of affairs, the sharps and flats of discourse, the difference between judicious and vulgar ears, and the proper times of speech and silence, let them be ever so intelligent, and ever so frank of their advice, or their counsels ever so good and just, yet all their endeavours, either of persuasion or force, are of little significance, and rather hasten the ruin of those they advise. But, at last, when the calamitous event has made the sufferers feel the effect of their neglect, they too late reverence their advisers, as deep, foreseeing, and faithful prophets.

Of this we have a remarkable instance in Cato of Utica, who discovered afar off, and long foretold, the approaching ruin of his country, both in the first conspiracy, and as it was prosecuted in the civil war between Cæsar and Pompey, yet did no good the while, but rather hurt the commonwealth, and hurried on its destruction, which Cicero wisely observed in these words : “ Cato, indeed, judges excellently, but prejudices the state ; for he speaks as in the commonwealth of Plato, and not as in the *drags* of Romulus.”

XVII.—THE FABLE OF THE SIRENS.

EXPLAINED OF MEN'S PASSION FOR PLEASURES.

INTRODUCTION.—The fable of the Sirens is, in a vulgar sense, justly enough explained of the pernicious incentives to pleasure; but the ancient mythology seems to us like a vintage ill-pressed and trod; for though something has been drawn from it, yet all the more excellent parts remain behind in the grapes that are untouched.

FABLE.—The Sirens are said to be the daughters of Achelous and Terpsichore, one of the Muses. In their early days they had wings, but lost them upon being conquered by the Muses, with whom they rashly contended; and with the feathers of these wings the Muses made themselves crowns, so that from this time the Muses wore wings on their heads, excepting only the mother to the Sirens.

These Sirens resided in certain pleasant islands, and when, from their watch-tower, they saw any ship approaching, they first detained the sailors by their music, then, enticing them to shore, destroyed them.

Their singing was not of one and the same kind, but they adapted their tunes exactly to the nature of each person, in order to captivate and secure him. And so destructive had they been, that these islands of the Sirens appeared, to a very great distance, white with the bones of their unburied captives.

Two different remedies were invented to protect persons against them, the one by Ulysses, the other by Orpheus. Ulysses commanded his associates to stop their ears close with wax; and he, determining to make the trial, and yet avoid the danger, ordered himself to be tied fast to a mast of the ship, giving strict charge not to be unbound, even though himself should entreat it; but Orpheus, without any binding at all, escaped the danger, by loudly chanting to his harp the praises of the gods, whereby he drowned the voices of the Sirens.

EXPLANATION.—This fable is of the moral kind, and appears no less elegant than easy to interpret. For pleasures proceed from plenty and affluence, attended with activity or exultation of the mind.* Anciently their first incentives were quick, and seized upon men as if they had been winged, but learning and philosophy afterwards prevailing, had at least the power to lay the mind under some restraint, and make it consider the issue of things, and thus deprived pleasures of their wings.

This conquest redounded greatly to the honour and ornament of the Muses; for after it appeared, by the example of a few, that philosophy could introduce a contempt of pleasures, it immediately seemed to be a sublime thing that could raise and elevate the soul, fixed in a manner

* The one denoted by the river Achelous, and the other by Terpsichore, the muse that invented the cithara and delighted in dancing.

down to the earth, and thus render men's thoughts, which reside in the head, winged as it were, or sublime.

Only the mother of the Sirens was not thus plumed on the head, which doubtless denotes superficial learning, invented and used for delight and levity ; an eminent example whereof we have in Petronius, who, after receiving sentence of death, still continued his gay frothy humour, and, as Tacitus observes, used his learning to solace or divert himself, and instead of such discourses as give firmness and constancy of mind, read nothing but loose poems and verses.* Such learning as this seems to pluck the crowns again from the Muses' heads, and restore them to the Sirens.

The Sirens are said to inhabit certain islands, because pleasures generally seek retirement, and often shun society. And for their songs, with the manifold artifice and destructiveness thereof, this is too obvious and common to need explanation. But that particular of the bones stretching like white cliffs along the shores, and appearing afar off, contains a more subtle allegory, and denotes that the examples of others' calamity and misfortunes, though ever so manifest and apparent, have yet but little force to deter the corrupt nature of man from pleasures.

The allegory of the remedies against the Sirens is not difficult, but very wise and noble : it proposes, in effect, three remedies, as well against subtle as violent mischiefs, two drawn from philosophy and one from religion.

The first means of escaping is to resist the earliest temptation in the beginning, and diligently avoid and cut off all occasions that may solicit or sway the mind ; and this is well represented by shutting up the ears, a kind of remedy to be necessarily used with mean and vulgar minds, such as the retinue of Ulysses.

But nobler spirits may converse, even in the midst of pleasures, if the mind be well guarded with constancy and resolution. And thus some delight to make a severe trial of their own virtue, and thoroughly acquaint themselves with the folly and madness of pleasures, without complying or being wholly given up to them ; which is what Solomon professes of himself when he closes the account of all the numerous pleasures he gave a loose to, with this expression, "But wisdom still continued with me." Such heroes in virtue may, therefore, remain unmoved by the greatest incentives to pleasure, and stop themselves on the very precipice of danger ; if, according to the example of Ulysses, they turn a deaf ear to pernicious counsel, and the flatteries of their friends and companions, which have the greatest power to shake and unsettle the mind.

* "*Vivamus, mea Lesbia, atque amemus ;
Rumoresque senum severiorum
Omnes unius estimemus assis.*"

And again—

"*Jura senes norint, et quod sit fasque nefasque
Inquirant tristes ; legumque examina servent.*"

But the most excellent remedy, in every temptation, is that of Orpheus, who, by loudly chanting and resounding the praises of the gods, confounded the voices, and kept himself from hearing the music of the Sirens; for divine contemplations exceed the pleasures of sense, not only in power, but also in sweetness.

XVIII.—THE FABLE OF DIOMED.

EXPLAINED OF PERSECUTION, OR ZEAL FOR RELIGION.

DIOMED acquired great glory and honour at the Trojan war, and was highly favoured by Pallas, who encouraged and excited him by no means to spare Venus, if he should casually meet her in fight. He followed the advice with too much eagerness and intrepidity, and accordingly wounded that goddess in her hand. This presumptuous action remained unpunished for a time, and when the war was ended he returned with great glory and renown to his own country, where, finding himself embroiled with domestic affairs, he retired into Italy. Here also at first he was well received and nobly entertained by King Daunus, who, besides other gifts and honours, erected statues for him over all his dominions. But upon the first calamity that afflicted the people after the stranger's arrival, Daunus immediately reflected that he entertained a devoted person in his palace, an enemy to the gods, and one who had sacrilegiously wounded a goddess with his sword, whom it was impious but to touch. To expiate, therefore, his country's guilt, he, without regard to the laws of hospitality, which were less regarded by him than the laws of religion, directly slew his guest, and commanded all his statues and all his honours to be razed and abolished. Nor was it safe for others to commiserate or bewail so cruel a destiny; but even his companions in arms, whilst they lamented the death of their leader, and filled all places with their complaints, were turned into a kind of swans, which are said, at the approach of their own death, to chant sweet melancholy dirges.

EXPLANATION.—This fable intimates an extraordinary and almost singular thing, for no hero besides Diomed is recorded to have wounded any of the gods. Doubtless we have here described the nature and fate of a man who professedly makes any divine worship or sect of religion, though in itself vain and light, the only scope of his actions, and resolves to propagate it by fire and sword. For although the bloody dissensions and differences about religion were unknown to the ancients, yet so copious and diffusive was their knowledge, that what they knew not by experience they comprehended in thought and representation. Those, therefore, who endeavour to reform or establish any sect of religion, though vain, corrupt, and infamous (which is here denoted under the person of Venus), not by the force of reason, learn-

ing, sanctity of manners, the weight of arguments, and examples, but would spread or extirpate it by persecution, pains, penalties, tortures, fire and sword. may perhaps be instigated hereto by Pallas, that is, by a certain rigid, prudential consideration, and a severity of judgment, by the vigour and efficacy whereof they see thoroughly into the fallacies and fictions of the delusions of this kind; and through aversion to depravity and a well-meant zeal, these men usually for a time acquire great fame and glory, and are by the vulgar, to whom no moderate measures can be acceptable, extolled and almost adored, as the only patrons and protectors of truth and religion, men of any other disposition seeming, in comparison with these, to be lukewarm, mean-spirited, and cowardly. This fame and felicity, however, seldom endures to the end; but all violence, unless it escapes the reverses and changes of things by untimely death, is commonly unprosperous in the issue; and if a change of affairs happens, and that sect of religion which was persecuted and oppressed gains strength and rises again, then the zeal and warm endeavours of this sort of men are condemned, their very name becomes odious, and all their honours terminate in disgrace.

As to the point that Diomed should be slain by his hospitable entertainer, this denotes that religious dissensions may cause treachery, bloody animosities, and deceit, even between the nearest friends.

That complaining or bemoaning should not, in so enormous a case, be permitted to friends affected by the catastrophe without punishment, includes this prudent admonition, that almost in all kinds of wickedness and depravity men have still room left for commiseration, so that they who hate the crime may yet pity the person and bewail his calamity, from a principle of humanity and good nature; and to forbid the overflowings and intercourses of pity upon such occasions were the extremest of evils; yet in the cause of religion and impiety the very commiserations of men are noted and suspected. On the other hand, the lamentations and complainings of the followers and attendants of Diomed, that is, of men of the same sect or persuasion, are usually very sweet, agreeable, and moving, like the dying notes of swans, or the birds of Diomed. This also is a noble and remarkable part of the allegory, denoting that the last words of those who suffer for the sake of religion strongly affect and sway men's minds, and leave a lasting impression upon the sense and memory.

XIX.—THE FABLE OF ACTEON AND PENTHEUS.

EXPLAINED OF CURIOSITY, OR PRYING INTO THE SECRETS OF PRINCES AND DIVINE MYSTERIES.

THE ancients afford us two examples for suppressing the impertinent curiosity of mankind, in diving into secrets, and imprudently longing and endeavouring to discover them. The one of these is in

the person of Acteon, and the other in that of Pentheus. Acteon, undesignedly chancing to see Diana naked, was turned into a stag, and torn to pieces by his own hounds. And Pentheus, desiring to pry into the hidden mysteries of Bacchus's sacrifice, and climbing a tree for that purpose, was struck with a phrensy. This phrensy of Pentheus caused him to see things double, particularly the sun, and his own city Thebes, so that running homewards, and immediately espying another Thebes, he runs towards that; and thus continues incessantly tending first to the one, and then to the other, without coming at either.

EXPLANATION.—The first of these fables may relate to the secrets of princes, and the second to divine mysteries. For they who are not intimate with a prince, yet, against his will have a knowledge of his secrets, inevitably incur his displeasure; and therefore, being aware that they are singled out, and all opportunities watched against them, they lead the life of a stag, full of fears and suspicions. It likewise frequently happens that their servants and domestics accuse them, and plot their overthrow, in order to procure favour with the prince; for whenever the king manifests his displeasure, the person it falls upon must expect his servants to betray him, and worry him down, as Acteon was worried by his own dogs.

The punishment of Pentheus is of another kind; for they who, unmindful of their mortal state, rashly aspire to divine mysteries, by climbing the heights of nature and philosophy, here represented by climbing a tree,—their fate is perpetual inconstancy, perplexity, and instability of judgment. For as there is one light of nature, and another light that is divine, they see, as it were, two suns. And as the actions of life, and the determinations of the will, depend upon the understanding, they are distracted as much in opinion as in will; and therefore judge very inconsistently, or contradictorily; and see, as it were, Thebes double: for Thebes being the refuge and habitation of Pentheus, here denotes the ends of actions: whence they know not what course to take, but remaining undetermined and unresolved in their views and designs, they are merely driven about by every sudden gust and impulse of the mind.

XX.—THE FABLE OF THE RIVER STYX.

EXPLAINED OF NECESSITY, IN THE OATHS OR SOLEMN LEAGUES OF PRINCES.

THE only solemn oath, by which the gods irrevocably obliged themselves, is a well-known thing, and makes a part of many ancient fables. To this oath they did not invoke any celestial divinity, or divine attribute, but only called to witness the river Styx; which, with many meanders, surrounds the infernal court of Dis. For this form

alone, and none but this, was held inviolable and obligatory : and the punishment of falsifying it, was that dreaded one of being excluded, for a certain number of years, the table of the gods.

EXPLANATION.—This fable seems invented to show the nature of the compacts and confederacies of princes : which, though ever so solemnly and religiously sworn to, prove but little the more binding for it : so that oaths in this case seem used, rather for decorum, reputation, and ceremony, than for fidelity, security, and effectuating. And though these oaths were strengthened with the bonds of affinity, which are the links and ties of nature, and again, by mutual services and good offices, yet we see all this will generally give way to ambition, convenience, and the thirst of power : the rather, because it is easy for princes under various specious pretences, to defend, disguise, and conceal their ambitious desires and insincerity ; having no judge to call them to account. There is, however, one true and proper confirmation of their faith, though no celestial divinity ; but that great divinity of princes, Necessity ; or, the danger of the state ; and the securing of advantage.

This necessity is elegantly represented by Styx, the fatal river, that can never be crossed back. And this deity it was, which Iphicrates the Athenian invoked in making a league : and because he roundly and openly avows what most others studiously conceal, it may be proper to give his own words. Observing that the Lacedæmonians were inventing and proposing a variety of securities, sanctions, and bonds of alliance, he interrupted them thus : “ There may indeed, my friends, be one bond and means of security between us : and that is, for you to demonstrate you have delivered into our hands, such things as that if you had the greatest desire to hurt us you could not be able.” Therefore, if the power of offending be taken away, or if by a breach of compact there be danger of destruction or diminution to the state or tribute, then it is that covenants will be ratified, and confirmed, as it were by the Stygian oath, whilst there remains an impending danger of being prohibited and excluded the banquet of the gods ; by which expression the ancients denoted the rights and prerogatives, the affluence and the felicities, of empire and dominion.

XXI.—THE FABLE OF JUPITER AND METIS.

EXPLAINED OF PRINCES AND THEIR COUNCIL.

THE ancient poets relate that Jupiter took Metis to wife, whose name plainly denotes counsel, and that he, perceiving she was pregnant by him, would by no means wait the time of her delivery, but directly devoured her : whence he himself also became pregnant, and was delivered in a wonderful manner ; for he from his head or brain brought forth Pallas armed.

EXPLANATION.—This fable, which in its literal sense appears monstrously absurd, seems to contain a state secret, and shows with what art kings usually carry themselves towards their council, in order to preserve their own authority and majesty not only inviolate, but so as to have it magnified and heightened among the people. For kings commonly link themselves as it were in a nuptial bond to their council and deliberate and communicate with them after a prudent and laudable custom upon matters of the greatest importance, at the same time justly concerning this no diminution of their majesty; but when the matter once ripens to a decree or order, which is a kind of birth, the king then suffers the council to go on no further, lest the act should seem to depend upon their pleasure. Now, therefore, the king usually assumes to himself whatever was wrought, elaborated, or formed, as it were, in the womb of the council (unless it be a matter of an invidious nature, which he is sure to put from him), so that the decree and the execution shall seem to flow from himself. And as this decree or execution proceeds with prudence and power, so as to imply necessity, it is elegantly wrapped up under the figure of Pallas armed.

Nor are kings content to have this seem the effect of their own authority, free will, and uncontrollable choice, unless they also take the whole honour to themselves, and make the people imagine that all good and wholesome decrees proceed entirely from their own head, that is, their own sole prudence and judgment.

XXII.—THE FABLE OF ENDYMION.

EXPLAINED OF COURT FAVOURITES.

THE goddess Luna is said to have fallen in love with the shepherd Endymion, and to have carried on her amours with him in a new and singular manner; it being her custom, whilst he lay reposing in his native cave, under Mount Latmus, to descend frequently from her sphere, enjoy his company whilst he slept, and then go up to heaven again. And all this while, Endymion's fortune was no way prejudiced by his unactive and sleepy life, the goddess causing his flocks to thrive, and grow so exceeding numerous, that none of the other shepherds could compare with him.

EXPLANATION.—This fable seems to describe the tempers and dispositions of princes, who, being thoughtful and suspicious, do not easily admit to their privacies such men as are prying, curious, and vigilant, or, as it were, sleepless; but rather such as are of an easy, obliging nature, and indulge them in their pleasures, without seeking anything farther; but seeming ignorant, insensible, or, as it were, lulled asleep before them. Princes usually treat such persons

familiarly ; and, quitting their throne like Luna, think they may with safety unbosom to them. This temper was very remarkable to Tiberius, a prince exceeding difficult to please, and who had no favourites but those that perfectly understood his way, and, at the same time, obstinately dissembled their knowledge, almost to a degree of stupidity.

The cave is not improperly mentioned in the fable ; it being a common thing for the favourites of a prince to have their pleasant retreats, whither to invite him, by way of relaxation, though without prejudice to their own fortunes ; these favourites usually making a good provision for themselves.

For though their prince should not, perhaps, promote them to dignities, yet, out of real affection, and not only for convenience, they generally feel the enriching influence of his bounty.

XXIII.—THE FABLE OF NEMESIS.

EXPLAINED OF THE REVERSES OF FORTUNE.

NEMESIS is represented as a goddess venerated by all, but feared by the powerful and the fortunate. She is said to be the daughter of Nox and Oceanus. She is drawn with wings, and a crown ; a javelin of ash in her right hand ; a glass containing Ethiopians in her left ; and riding upon a stag.

EXPLANATION.—The fable receives this explanation. The word Nemesis manifestly signifies revenge or retribution ; for the office of this goddess consisted in interposing, like the Roman tribunes, with an “I forbid it” in all courses of constant and perpetual felicity, so as not only to chastise haughtiness, but also to repay even innocent and moderate happiness with adversity ; as if it were decreed, that none of human race should be admitted to the banquet of the gods, but for sport. And, indeed, to read over that chapter of Pliny wherein he has collected the miseries and misfortunes of Augustus Cæsar, whom of all mankind one would judge most fortunate,—as he had a certain art of using and enjoying prosperity, with a mind no way tumid, light, effeminate, confused, or melancholic,—one cannot but think this a very great and powerful goddess, who could bring such a victim to her altar.*

The parents of this goddess were Oceanus and Nox ; that is, the fluctuating change of things, and the obscure and secret divine decrees. The changes of things are aptly represented by the Ocean, on account of its perpetual ebbing and flowing ; and secret providence is justly

* As she also brought the author himself.

expressed by Night. Even the heathens have observed this secret Nemesis of the night, or the difference betwixt divine and human judgment.*

Wings are given to Nemesis, because of the sudden and unforeseen changes of things; for, from the earliest account of time, it has been common for great and prudent men to fall by the dangers they most despised. Thus Cicero, when admonished by Brutus of the infidelity and rancour of Octavius, coolly wrote back, "I cannot, however, but be obliged to you, Brutus, as I ought, for informing me, though of such a trifle."

Nemesis also has her crown, by reason of the invidious and malignant nature of the vulgar, who generally rejoice, triumph, and crown her, at the fall of the fortunate and the powerful. And for the javelin in her right hand, it has regard to those whom she has actually struck and transfixed. But whoever escapes her stroke, or feels not actual calamity or misfortune, she affrights with a black and dismal sight in her left hand: for doubtless, mortals on the highest pinnacle of felicity have a prospect of death, diseases, calamities, perfidious friends, undermining enemies, reverses of fortune, etc., represented by the Ethiopians in her glass. Thus Virgil, with great elegance, describing the battle of Actium, says of Cleopatra, that, "she did not yet perceive the two asps behind her;"† but soon after, which way soever she turned, she saw whole troops of Ethiopians still before her.

Lastly, it is significantly added, that Nemesis rides upon a stag, which is a very long lived creature; for though perhaps some, by an untimely death in youth, may prevent or escape this goddess, yet they who enjoy a long flow of happiness and power, doubtless become subject to her at length, and are brought to yield.

XXIV.—THE FABLE OF CYCLOP'S DEATH.

EXPLAINED OF BASE COURT OFFICERS.

It is related that the Cyclops, for their savageness and cruelty, were by Jupiter first thrown into Tartarus, and there condemned to perpetual imprisonment: but that afterwards, Tellus persuaded Jupiter it would be for his service to release them, and employ them in forging thunderbolts. This he accordingly did; and they, with unwearied pains and diligence, hammered out his bolts, and other instruments of terror, with a frightful and continual din of the anvil.

* "——— eadit Regibus, just. Minervius,
Qui fuit ex Teueris, et servanti sumis equi:
Dixit aliter vivum."

† Regina in medias patrio vocat agmina sistro:
Necdum etiam geminos à tergo respicit angues."

It happened long after, that Jupiter was displeased with *Æsculapius*, the son of *Apollo*, for having, by the art of medicine, restored a dead man to life; but concealing his indignation, because the action in itself was pious and illustrious, he secretly incensed the Cyclops against him, who, without remorse, presently slew him with their thunderbolts: in revenge whereof, *Apollo*, with Jupiter's connivance, shot them all dead with his arrows.

EXPLANATION.—This fable seems to point at the behaviour of princes, who, having cruel, bloody, and oppressive ministers, first punish and displace them; but afterwards, by the advice of *Tellus*, that is, some earthly-minded and ignoble person, employ them again, to serve a turn, when there is occasion for cruelty in execution, or severity in exaction: but these ministers, being base in their nature, whet by their former disgrace, and well aware of what is expected from them, use double diligence in their office; till, proceeding unwarily, and over eager to gain favour, they sometimes, from the private nods, and ambiguous orders of their prince, perform some odious or execrable action. When princes, to decline the envy themselves, and knowing they shall never want such tools at their back, drop them, and give them up to the friends and followers of the injured person; thus exposing them, as sacrifices to revenge and popular odium: whence with great applause, acclamations, and good wishes to the prince, these miscreants at last meet with their desert.

XXV.—THE FABLE OF THE GIANTS' SISTER.

EXPLAINED OF PUBLIC DETRACTION.

THE poets relate, that the giants, produced from the earth, made war upon Jupiter and the other gods, but were repulsed and conquered by thunder; whereat the earth, provoked, brought forth *Fame*, the youngest sister of the giants, in revenge for the death of her sons.

EXPLANATION.—The meaning of the fable seems to be this: the earth denotes the nature of the vulgar, who are always swelling, and rising against their rulers, and endeavouring at changes. This disposition, getting a fit opportunity, breeds rebels and traitors, who, with impetuous rage, threaten and contrive the overthrow and destruction of princes.

And when brought under and subdued, the same vile and restless nature of the people, impatient of peace, produces rumours, detractions, slanders, libels, etc., to blacken those in authority; so that rebellious actions and seditious rumours, differ not in origin and stock, but only as it were in sex; treasons and rebellions being the brothers, and scandal or detraction the sister.

XXVI.—THE FABLE OF TYPHON.

EXPLAINED OF REBELLION.

THE fable runs, that Juno, enraged at Jupiter's bringing forth Pallas without her assistance, incessantly solicited all the gods and goddesses, that she might produce without Jupiter: and having by violence and importunity obtained the grant, she struck the earth, and thence immediately sprung up Typhon, a huge and dreadful monster, whom she committed to the nursing of a serpent. As soon as he was grown up, this monster waged war on Jupiter, and taking him prisoner in the battle, carried him away on his shoulders, into a remote and obscure quarter: and there cutting out the sinews of his hands and feet, he bore them off, leaving Jupiter behind miserably maimed and mangled.

But Mercury afterwards stole these sinews from Typhon, and restored them to Jupiter. Hence, recovering his strength, Jupiter again pursues the monster; first wounds him with a stroke of his thunder, when serpents arose from the blood of the wound: and now the monster being dismayed, and taking to flight, Jupiter next darted Mount *Ætna* upon him, and crushed him with the weight.

EXPLANATION.—This fable seems designed to express the various fates of kings, and the turns that rebellions sometimes take, in kingdoms. For princes may be justly esteemed married to their states, as Jupiter to Juno: but it sometimes happens, that, being depraved by long wielding of the sceptre, and growing tyrannical, they would engross all to themselves; and slighting the counsel of their senators and nobles, conceive by themselves; that is, govern according to their own arbitrary will and pleasure. This inflames the people, and makes them endeavour to create and set up some head of their own. Such designs are generally set on foot by the secret motion and instigation of the peers and nobles, under whose connivance the common sort are prepared for rising: whence proceeds a swell in the state, which is appositely denoted by the nursing of Typhon. This growing posture of affairs is fed by the natural depravity, and malignant dispositions of the vulgar, which to kings is an envenomed serpent. And now the disaffected, uniting their force, at length break out into open rebellion, which, producing infinite mischiefs, both to prince and people, is represented by the horrid and multiplied deformity of Typhon, with his hundred heads, denoting the divided powers; his flaming mouths, denoting fire and devastation; his girdles of snakes, denoting sieges and destruction; his iron hands, slaughter and cruelty; his eagle's talons, rapine and plunder; his plumed body, perpetual rumours, contradictory accounts, etc. And sometimes these rebellions grow so high, that kings are obliged, as if carried on the backs of the rebels, to quit the throne, and retire to

some remote and obscure part of their dominions, with the loss of their sinews, both of money and majesty.

But if now they prudently bear this reverse of fortune, they may, in a short time, by the assistance of Mercury, recover their sinews again ; that is, by becoming moderate and affable ; reconciling the minds and affections of the people to them, by gracious speeches, and prudent proclamations, which will win over the subject cheerfully to afford new aids and supplies, and add fresh vigour to authority. But prudent and wary princes here seldom incline to try fortune by a war, yet do their utmost, by some grand exploit, to crush the reputation of the rebels : and if the attempt succeeds, the rebels, conscious of the wound received, and distrustful of their cause, first betake themselves to broken and empty threats, like the hissings of serpents ; and next, when matters are grown desperate, to flight. And now, when they thus begin to shrink, it is safe and seasonable for kings to pursue them with their forces, and the whole strength of the kingdom ; thus effectually quashing and suppressing them, as it were by the weight of a mountain.

XXVII.—THE FABLE OF ACHELOUS.

EXPLAINED OF WAR BY INVASION.

THE ancients relate, that Hercules and Achelous being rivals in the courtship of Deianira, the matter was contested by single combat ; when Achelous having transformed himself, as he had power to do, into various shapes, by way of trial ; at length, in the form of a fierce wild bull, prepares himself for the fight ; but Hercules still retains his human shape, engages sharply with him, and in the issue broke off one of the bull's horns ; and now Achelous, in great pain and fright, to redeem his horn, presents Hercules with the cornucopia.

EXPLANATION.—This fable relates to military expeditions and preparations ; for the preparation of war on the defensive side, here denoted by Achelous, appears in various shapes, whilst the invading side has but one simple form, consisting either in an army, or perhaps a fleet. But the country that expects the invasion is employed in infinite ways, in fortifying towns, blockading passes, rivers, and ports, raising soldiers, disposing garrisons, building and breaking down bridges, procuring aids, securing provisions, arms, ammunition, etc. So that there appears a new phase of things every day ; and at length, when the country is sufficiently fortified and prepared, it represents to the life the form and threats of a fierce fighting bull.

On the other side, the invader presses on to the fight, fearing to be distressed in an enemy's country. And if after the battle he

remains master of the field, and has now broke, as it were, the horn of his enemy, the besieged, of course, retire inglorious, affrighted, and dismayed, to their stronghold, there endeavouring to secure themselves, and repair their strength; leaving, at the same time, their country a prey to the conqueror, which is well expressed by the Amalthean horn, or cornucopia.

XXVIII.—THE FABLE OF DÆDALUS.

EXPLAINED OF ARTS AND ARTISTS IN KINGDOMS AND STATES.

THE ancients have left us a description of mechanical skill, industry, and curious arts converted to ill uses, in the person of Dædalus, a most ingenious but execrable artist. This Dædalus was banished for the murder of his brother artist and rival, yet found a kind reception in his banishment from the kings and states where he came. He raised many incomparable edifices to the honour of the gods, and invented many new contrivances for the beautifying and ennobling of cities and public places, but still he was most famous for wicked inventions. Among the rest, by his abominable industry and destructive genius he assisted in the fatal and infamous production of the monster Minotaur, that devourer of promising youths. And then, to cover one mischief with another, and provide for the security of this monster, he invented and built a labyrinth; a work infamous for its end and design, but admirable and prodigious for art and workmanship. After this, that he might not only be celebrated for wicked inventions, but be sought after, as well for prevention, as for instruments of mischief, he formed that ingenious device of his clue, which led directly through all the windings of the labyrinth. This Dædalus was persecuted by Minos with the utmost severity, diligence, and inquiry; but he always found refuge and means of escaping. Lastly, endeavouring to teach his son Icarus the art of flying, the novice, trusting too much to his wings, fell from his towering flight, and was drowned in the sea.

EXPLANATION.—The sense of the fable runs thus. It first denotes envy, which is continually upon the watch, and strangely prevails among excellent artificers; for no kind of people are observed to be more implacably and destructively envious to one another than these.

In the next place, it observes an impolitic and improvident kind of punishment inflicted upon Dædalus,—that of banishment; for good workmen are gladly received everywhere, so that banishment to an excellent artificer is scarce any punishment at all; whereas other conditions of life cannot easily flourish from home. For the admiration of artists is propagated and increased among foreigners and strangers; it being a principle in the minds of men to slight and despise the mechanical operators of their own nation.

The succeeding part of the fable is plain, concerning the use of mechanic arts, whereto human life stands greatly indebted, as receiving from this treasury numerous particulars for the service of religion, the ornament of civil society, and the whole provision and apparatus of life ; but then the same magazine supplies instruments of lust, cruelty, and death. For, not to mention the arts of luxury and debauchery, we plainly see how far the business of exquisite poisons, guns, engines of war, and such kind of destructive inventions, exceeds the cruelty and barbarity of the Minotaur himself.

The addition of the labyrinth contains a beautiful allegory, representing the nature of mechanic arts in general ; for all ingenious and accurate mechanical inventions may be conceived as a labyrinth, which, by reason of their subtilty, intricacy, crossing and interfering with one another, and the apparent resemblances they have among themselves, scarce any power of the judgment can unravel and distinguish ; so that they are only to be understood and traced by the clue of experience.

It is no less prudently added that he who invented the windings of the labyrinth, should also show the use and management of the clue ; for mechanical arts have an ambiguous or double use, and serve as well to produce as to prevent mischief and destruction : so that their virtue almost destroys or unwinds itself.

Unlawful arts, and indeed frequently arts themselves, are persecuted by Minos, that is, by laws which prohibit and forbid their use among the people ; but notwithstanding this, they are hid, concealed, retained, and everywhere find reception and skulking-places ; a thing well observed by Tacitus of the astrologers and fortune-tellers of his time. "These," says he, "are a kind of men that will always be prohibited, and yet will always be retained in our city."

But lastly, all unlawful and vain arts, of what kind soever lose their reputation in tract of time ; grow contemptible and perish, through their over-confidence, like Icarus ; being commonly unable to perform what they boasted. And to say the truth, such arts are better suppressed by their own vain pretensions, than checked or restrained by the bridle of laws.

XXIX.—THE FABLE OF DIONYSUS.

EXPLAINED OF THE PASSIONS.

THE fable runs, that Semele, Jupiter's mistress, having bound him by an inviolable oath to grant her an unknown request, desired he would embrace her in the same form and manner he used to embrace Juno ; and the promise being irrevocable, she was burnt to death with lightning in the performance. The embryo, however, was sewed up, and carried in Jupiter's thigh till the complete time of its birth ;

but the burthen thus rendering the father lame, and causing him pain, the child was thence called Dionysus. When born, he was committed for some years, to be nursed by Proserpine ; and when grown up, appeared with so effeminate a face, that his sex seemed somewhat doubtful. He also died, and was buried for a time, but afterwards revived. When a youth, he first introduced the cultivation and dressing of vines, the method of preparing wine, and taught the use thereof ; whence becoming famous, he subdued the world, even to the utmost bounds of the Indies. He rode in a chariot drawn by tigers. There danced about him certain deformed demons called Cobali, etc. The Muses also joined in his train. He married Ariadne, who was deserted by Theseus. The ivy was sacred to him. He was also held the inventor and institutor of religious rites and ceremonies, but such as were wild, frantic, and full of corruption and cruelty. He had also the power of striking men with frenzies. Pentheus and Orpheus were torn to pieces by the frantic women at his orgies ; the first for climbing a tree to behold their outrageous ceremonies, and the other for the music of his harp. But the acts of this god are much entangled and confounded with those of Jupiter.

EXPLANATION.—This fable seems to contain a little system of morality, so that there is scarce any better invention in all ethies. Under the history of Bacchus is drawn the nature of unlawful desire or affection, and disorder ; for the appetite and thirst of apparent good is the mother of all unlawful desire, though ever so destructive, and all unlawful desires are conceived in unlawful wishes or requests, rashly indulged or granted before they are well understood or considered, and when the affection begins to grow warm, the mother of it (the nature of good) is destroyed and burnt up by the heat. And whilst an unlawful desire lies in the embryo, or unripened in the mind, which is its father, and here represented by Jupiter, it is cherished and concealed, especially in the inferior parts of the mind, corresponding to the thigh of the body, where pain twitches and depresses the mind so far as to render its resolutions and actions imperfect and lame. And even after this child of the mind is confirmed, and gains strength by consent and habit, and comes forth into action, it must still be nursed by Proserpine for a time : that is, it skulks and hides its head in a clandestine manner, as it were, under ground, till at length, when the checks of shame and fear are removed, and the requisite boldness acquired, it either resumes the pretext of some virtue, or openly despises infamy. And it is justly observed, that every vehement passion appears of a doubtful sex, as having the strength of a man at first, but at last the impotence of a woman. It is also excellently added, that Bacchus died and rose again ; for the affections sometimes seem to die and be no more ; but there is no trusting them, even though they were buried, being always apt and ready to rise again whenever the occasion or object offers.

That Bacchus should be the inventor of wine carries a fine allegory with it ; for every affection is cunning and subtle in discovering

a proper matter to nourish and feed it; and of all things known to mortals, wine is the most powerful and effectual for exciting and inflaming passions of all kinds, being indeed like a common fuel to all.

It is again with great elegance observed of Bacchus, that he subdued provinces, and undertook endless expeditions, for the affections never rest satisfied with what they enjoy, but with an endless and insatiable appetite thirst after something further. And tigers are prettily feigned to draw the chariot; for as soon as any affection shall, from going on foot, be advanced to ride, it triumphs over reason, and exerts its cruelty, fierceness, and strength against all that oppose it.

It is also humorously imagined, that ridiculous demons dance and frisk about this chariot; for every passion produces indecent, disorderly, interchangeable, and deformed motions in the eyes, countenance, and gesture, so that the person under the impulse, whether of anger, insult, love, etc., though to himself he may seem grand, lofty, or obliging, yet in the eyes of others appears mean, contemptible, or ridiculous.

The Muses also are found in the train of Bacchus, for there is scarce any passion without its art, science, or doctrine to court and flatter it; but in this respect the indulgence of men of genius has greatly detracted from the majesty of the Muses, who ought to be the leaders and conductors of human life, and not the handmaids of the passions.

The allegory of Bacchus falling in love with a cast mistress, is extremely noble; for it is certain that the affections always court and covet what has been rejected upon experience. And all those who by serving and indulging their passions immensely raise the value of enjoyment, should know, that whatever they covet and pursue, whether riches, pleasure, glory, learning, or anything else, they only pursue those things that have been forsaken and cast off with contempt by great numbers in all ages, after possession and experience.

Nor is it without a mystery that the ivy was sacred to Bacchus, and this for two reasons: first, because ivy is an evergreen, or flourishes in the winter; and secondly, because it winds and creeps about so many things, as trees, walls, and buildings, and raises itself above them. As to the first, every passion grows fresh, strong, and vigorous by opposition and prohibition, as it were, by a kind of contrast or antiperistasis, like the ivy in the winter. And for the second, the predominant passion of the mind throws itself, like the ivy, round all human actions, entwines all our resolutions, and perpetually adheres to, and mixes itself among, or even overtops them.

And no wonder that superstitious rites and ceremonies are attributed to Bacchus, when almost every ungovernable passion grows wanton and luxurious in corrupt religions; nor again, that fury and frenzy should be sent and dealt out by him, because every passion is a short frenzy, and if it be vehement, lasting, and take deep root

it terminates in madness. And hence the allegory of Pentheus and Orpheus being torn to pieces is evident ; for every headstrong passion is extremely bitter, severe, inveterate, and revengeful upon all curious inquiry, wholesome admonition, free counsel and persuasion.

Lastly, the confusion between the persons of Jupiter and Bacchus will justly admit of an allegory, because noble and meritorious actions may sometimes proceed from virtue, sound reason, and magnanimity, and sometimes again from a concealed passion and secret desire of ill, however they may be extolled and praised, insomuch that it is not easy to distinguish betwixt the acts of Bacchus and the acts of Jupiter.

XXX.—THE FABLE OF PERSEUS, OR WAR.

EXPLAINED OF THE PREPARATION AND CONDUCT NECESSARY
TO WAR;

“THE fable relates, that Perseus was despatched from the east by Pallas, to cut off Medusa's head, who had committed great ravage upon the people of the west ; for this Medusa was so dire a monster as to turn into stone all those who but looked upon her. She was a Gorgon, and the only mortal one of the three, the other two being invulnerable. Perseus, therefore, preparing himself for this grand enterprise, had presents made him from three of the gods : Mercury gave him wings for his heels ; Pluto, a helmet ; and Pallas, a shield and a mirror. But though he was now so well equipped, he posted not directly to Medusa, but first turned aside to the Grææ, who were half-sisters to the Gorgons. These Grææ were grey-headed, and like old women from their birth, having among them all three but one eye, and one tooth, which, as they had occasion to go out, they each wore by turns, and laid them down again upon coming back. This eye and this tooth they lent to Perseus, who now judging himself sufficiently furnished, he, without farther stop, flies swiftly away to Medusa, and finds her asleep. But not venturing his eyes, for fear she should wake, he turned his head aside, and viewed her in Pallas's mirror ; and thus directing his stroke, cut off her head ; when immediately from the gushing blood, there darted Pegasus winged. Perseus now inserted Medusa's head into Pallas's shield, which thence retained the faculty of astonishing and benumbing all who looked on it.”

This fable seems invented to show the prudent method of choosing, undertaking, and conducting a war ; and, accordingly, lays down three useful precepts about it, as if they were the precepts of Pallas.

The first is, that no prince should be over-solicitous to subdue a neighbouring nation ; for the method of enlarging an empire is very different from that of increasing an estate. Regard is justly had to contiguity, or adjacency, in private lands or possessions ; but in the extending of empire, the occasion, the facility, and advantage of a war, are to be

regarded instead of vicinity. It is certain that the Romans, at the time they stretched but little beyond Liguria to the west, had by their arms subdued the provinces as far as Mount Taurus to the east. And thus Perseus readily undertook a very long expedition, even from the east to the extremities of the west.

The second precept is, that the cause of the war be just and honourable; for this adds alacrity both to the soldiers, and the people who find the supplies; procures aids, alliances, and numerous other conveniences. Now there is no cause of war more just and laudable, than the suppression of tyranny, by which a people are dispirited, benumbed, or left without life and vigour, as at the sight of Medusa.

Lastly, it is prudently added, that as there were three of the Gorgons, who represent war, Perseus singled her out for his expedition that was mortal; which affords this precept, that such kind of wars should be chosen as may be brought to a conclusion, without pursuing vast and infinite hopes.

Again Perseus's setting-out is extremely well adapted to his undertaking, and in a manner commands success; he received despatch from Mercury, secrecy from Pluto, and foresight from Pallas. It also contains an excellent allegory, that the wings given him by Mercury were for his heels, not for his shoulders; because expedition is not so much required in the first preparations for war, as in the subsequent matters, that administer to the first; for there is no error more frequent in war, than, after brisk preparations, to halt for subsidiary forces and effective supplies.

The allegory of Pluto's helmet, rendering men invisible and secret, is sufficiently evident of itself; but the mystery of the shield and the mirror lies deeper, and denotes, that not only a prudent caution must be had to defend, like the shield, but also such an address and penetration as may discover the strength, the motions, the counsels, and designs of the enemy; like the mirror of Pallas.

But though Perseus may now seem extremely well prepared, there still remains the most important thing of all; before he enters upon the war, he must of necessity consult the Greæ. These Greæ are treasons; half, but degenerate sisters of the Gorgons; who are representatives of wars: for wars are generous and noble: but treasons base and vile. The Greæ are elegantly described as hoary-headed, and like old women from their birth; on account of the perpetual cares, fears, and trepidations attending traitors. Their force, also, before it breaks out into open revolt, consists either in an eye or a tooth; for all faction, alienated from a state, is both watchful and biting; and this eye and tooth are, as it were, common to all the disaffected; because whatever they learn and know is transmitted from one to another, as by the hands of faction. And for the tooth, they all bite with the same; and clamour with one throat; so that each of them singly expresses the multitude.

These Greæ, therefore, must be prevailed upon by Perseus to lend him their eye and their tooth; the eye to give him indications, and make discoveries; the tooth for sowing rumours, raising envy, and

stirring up the minds of the people. And when all these things are thus disposed and prepared, then follows the action of the war.

He finds Medusa asleep ; for whoever undertakes a war with prudence, generally falls upon the enemy unprepared, and nearly in a state of security ; and here is the occasion for Pallas's mirror : for it is common enough, before the danger presents itself, to see exactly into the state and posture of the enemy ; but the principal use of the glass is, in the very instant of danger, to discover the manner thereof, and prevent consternation ; which is the thing intended by Perseus's turning his head aside, and viewing the enemy in the glass.

Two effects here follow the conquest : 1. The darting forth of Pegasus ; which evidently denotes fame, and flies abroad, proclaiming the victory far and near. 2. The bearing of Medusa's head in the shield, which is the greatest possible defence and safeguard ; for one grand and memorable enterprise, happily accomplished, bridles all the motions and attempts of the enemy, stupifies disaffection, and quells commotions.

XXXI.—THE FABLE OF PAN, OR NATURE.

EXPLAINED OF NATURAL PHILOSOPHY.

THE ancients have, with great exactness, delineated universal nature under the person of Pan. They leave his origin doubtful ; some asserting him the son of Mercury, and others the common offspring of all Penelope's suitors. The latter supposition doubtless occasioned some later rivals to entitle this ancient fable Penelope ; a thing frequently practised when the earlier relations are applied to more modern characters and persons, though sometimes with great absurdity and ignorance, as in the present case ; for Pan was one of the ancientest gods, and long before the time of Ulysses ; besides, Penelope was venerated by antiquity for her matronal chastity. A third sort will have him the issue of Jupiter and Hybris, that is Reproach. But whatever his origin was, the Destinies are allowed his sisters.

He is described by antiquity, with pyramidal horns reaching up to heaven, a rough and shaggy body, a very long beard, of a biform figure, human above, half brute below, ending in goat's feet. His arms, or ensigns of power, are a pipe in his left hand, composed of seven reeds ; in his right a crook ; and he wore for his mantle a leopard's skin.

His attributes and titles were the god of hunters, shepherds, and all the rural inhabitants ; president of the mountains ; and, after Mercury, the next messenger of the gods. He was also held the leader and ruler of the Nymphs who continually danced and frisked about him, attended with the Satyrs and their elders, the Sileni. He had also the power of striking terrors, especially such as were vain and superstitious ; whence they came to be called panic terrors.

Few actions are recorded of him, only a principal one is, that he challenged Cupid at wrestling, and was worsted. He also caught the

giant Typhon in a net, and held him fast. They relate farther of him, that when Ceres, growing disconsolate for the rape of Proserpine, hid herself, and all the gods took the utmost pains to find her, by going out different ways for that purpose, Pan only had the good fortune to meet her, as he was hunting, and discovered her to the rest. He likewise had the assurance to rival Apollo in music ; and in the judgment of Midas was preferred ; but the judge had, though with great privacy and secrecy, a pair of ass's ears fastened on him for his sentence.

There is very little said of his amours; which may seem strange among such a multitude of gods, so profusely amorous. He is only reported to have been very fond of Echo, who was also esteemed his wife ; and one nymph more, called Syrinx, with the love of whom Cupid inflamed him for his insolent challenge ; so he is reported once to have solicited the moon to accompany him apart into the deep woods.

Lastly, Pan had no descendant, which also is a wonder, when the male gods were so extremely prolific ; only he was the reputed father of a servant-girl called Lambe, who used to divert strangers with her ridiculous prattling stories.

This fable is perhaps the noblest of all antiquity, and pregnant with the mysteries and secrets of nature. Pan, as the name imports, represents the universe, about whose origin there are two opinions, viz., that it either sprung from Mercury, that is, the divine word, according to the Scriptures and philosophical divines, or from the confused seeds of things. For they who allow only one beginning of all things, either ascribe it to God ; or if they suppose a material beginning, acknowledge it to be various in its powers ; so that the whole dispute comes to these points ; viz., either that nature proceeds from Mercury, or from Penelope and all her suitors.*

The third origin of Pan seems borrowed by the Greeks from the Hebrew mysteries, either by means of the Egyptians, or otherwise ; for it relates to the state of the world, not in its first creation, but as made subject to death and corruption after the fall ; and in this state it was and remains, the offspring of God and Sin, or Jupiter and Reproach. And therefore these three several accounts of Pan's birth may seem true, if duly distinguished in respect of things and times. For this Pan, or the universal nature of things, which we view and contemplate, had its origin from the divine Word and confused matter, first created by God himself, with the subsequent introduction of sin, and consequently corruption.

The Destinies, or the natures and fates of things, are justly made Pan's sisters, as the chain of natural causes links together the rise, duration, and corruption : the exaltation, degeneration, and works ; the processes, the effects, and changes, of all that can any way happen to things.

* "Namque caneat uti magnum per inane coacta
Semina terrarumque animæque marisque fuissent ;
Et liquidi simul ignis ; ut his exordia primis
Omnia, et ipse tener mundi concreverit orbis."—Virgil, *Ecl.* vi. 31.

Horns are given him, broad at the roots, but narrow and sharp at the top, because the nature of all things seems pyramidal ; for individuals are infinite, but being collected into a variety of species, they rise up into kinds, and these again ascend, and are contracted into generals, till at length nature may seem collected to a point. And no wonder if Pan's horns reach to the heavens, since the sublimities of nature, or abstract ideas, reach in a manner to things divine ; for there is a short and ready passage from metaphysics to natural theology.

Pan's body, or the body of nature, is, with great propriety and elegance, painted shaggy and hairy, as representing the rays of things ; for rays are as the hair, or fleece of nature, and more or less worn by all bodies. This evidently appears in vision, and in all effects or operations at a distance ; for whatever operates thus may be properly said to emit rays. But particularly the beard of Pan is exceeding long, because the rays of the celestial bodies penetrate, and act to a prodigious distance, and have descended into the interior of the earth so far as to change its surface ; and the sun himself, when clouded on its upper part, appears to the eye bearded.

Again, the body of nature is justly described biform, because of the difference between its superior and inferior parts, as the former, for their beauty, regularity of motion, and influence over the earth, may be properly represented by the human figure, and the latter, because of their disorder, irregularity, and subjection to the celestial bodies, are by the brutal. This biform figure also represents the participation of one species with another ; for there appear to be no simple natures ; but all participate or consist of two ; thus man has somewhat of the brute, the brute somewhat of the plant, the plant somewhat of the mineral ; so that all natural bodies have really two faces, or consist of a superior and an inferior species.

There lies a curious allegory in the making of Pan goatfooted, on account of the motion of ascent which the terrestrial bodies have towards the air and heavens ; for the goat is a clambering creature, that delights in climbing up rocks and precipices ; and in the same manner the matters destined to this lower globe strongly affect to rise upwards, as appears from the clouds and meteors.

Pan's arms, or the ensigns he bears in his hands, are of two kinds—the one an emblem of harmony, the other of empire. His pipe, composed of seven reeds, plainly denotes the consent and harmony, or the concords and discords of things, produced by the motion of the seven planets. His crook also contains a fine representation of the ways of nature, which are partly straight and partly crooked ; thus the staff, having an extraordinary bend towards the top, denotes that the works of Divine Providence are generally brought about by remote means, or in a circuit, as if somewhat else were intended rather than the effect produced, as in the sending of Joseph into Egypt, etc. So likewise in human government, they who sit at the helm manage and wind the people more successfully by pretext and oblique courses, than they could by such as are direct and straight ; so that, in effect, all sceptres are crooked at the top.

Pan's mantle, or clothing, is with great ingenuity made of a leopard's skin, because of the spots it has ; for in like manner the heavens are sprinkled with stars, the sea with islands, the earth with flowers, and almost each particular thing is variegated, or wears a mottled coat.

The office of Pan could not be more livelily expressed than by making him the god of hunters ; for every natural action, every motion and process, is no other than a chase : thus arts and sciences hunt out their works, and human schemes and counsels their several ends ; and all living creatures either hunt out their aliment, pursue their prey, or seek their pleasures, and this in a skilful and sagacious manner.* He is also styled the god of the rural inhabitants, because men in this situation live more according to nature than they do in cities and courts, where nature is so corrupted with effeminate arts, that the saying of the poet may be verified—

— pars minima est ipsa puella sui.

He is likewise particularly styled President of the Mountains, because in mountains and lofty places the nature of things lies more open and exposed to the eye and the understanding.

In his being called the messenger of the gods, next after Mercury, lies a divine allegory, as next after the Word of God, the image of the world is the herald of the Divine power and wisdom, according to the expression of the Psalmist, "The heavens declare the glory of God, and the firmament sheweth his handiwork."

Pan is delighted with the company of the Nymphs ; that is, the souls of all living creatures are the delight of the world ; and he is properly called their governor, because each of them follows its own nature as a leader, and all dance about their own respective rings, with infinite variety and never-ceasing motion. And with these continually join the Satyrs and Sileni ; that is, youth and age ; for all things have a kind of young, cheerful, and dancing time ; and again their time of slowness, tottering, and creeping. And whoever, in a true light, considers the motions and endeavours of both these ages, like another Democritus, will perhaps find them as odd and strange as the gesticulations and antic motions of the Satyrs and Sileni.

The power he had of striking terrors contains a very sensible doctrine ; for nature has implanted fear in all living creatures ; as well to keep them from risking their lives, as to guard against injuries and violence ; and yet this nature or passion keeps not its bounds, but with just and profitable fears always mixes such as are vain and senseless ; so that all things, if we could see their insides, would appear full of panic terrors. Thus mankind, particularly the vulgar, labour under a high degree of superstition, which is nothing more than a panic-dread that principally reigns in unsettled and troublesome times.

* "Torva læna lupum sequitur, lupus ipse capellam :
Florentem cytisum sequitur lasciva capella."

The presumption of Pan in challenging Cupid to the conflict, denotes that matter has an appetite and tendency to a dissolution of the world, and falling back to its first chaos again, unless this depravity and inclination were restrained and subdued by a more powerful concord and agreement of things, properly expressed by Love or Cupid ; it is therefore well for mankind, and the state of all things, that Pan was thrown and conquered in the struggle.

His catching and detaining Typhon in the net receives a similar explanation ; for whatever vast and unusual swells, which the word typhon signifies, may sometimes be raised in nature, as in the sea, the clouds, the earth, or the like, yet nature catches, entangles, and holds all such outrages and insurrections in her inextricable net, wove as it were of adamant.

That part of the fable which attributes the discovery of lost Ceres to Pan, whilst he was hunting—a happiness denied the other gods, though they diligently and expressly sought her—contains an exceeding just and prudent admonition ; viz., that we are not to expect the discovery of things useful in common life, as that of corn, denoted by Ceres, from abstract philosophies, as if these were the gods of the first order,—no, not though we used our utmost endeavours this way,—but only from Pan, that is, a sagacious experience and general knowledge of nature, which is often found, even by accident, to stumble upon such discoveries whilst the pursuit was directed another way.

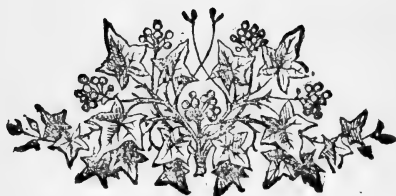
The event of his contending with Apollo in music affords us a useful instruction, that may help to humble the human reason and judgment, which is too apt to boast and glory in itself. There seems to be two kinds of harmony—the one of Divine Providence, the other of human reason ; but the government of the world, the administration of its affairs, and the more secret Divine judgments, sound harsh and dissonant to human ears or human judgment ; and though this ignorance be justly rewarded with asses' ears, yet they are put on and worn, not openly, but with great secrecy ; nor is the deformity of the thing seen or observed by the vulgar.

We must not find it strange if no amours are related of Pan besides his marriage with Echo ; for nature enjoys itself, and in itself all other things. He that loves desires enjoyment, but in profusion there is no room for desire ; and therefore Pan, remaining content with himself, has no passion unless it be for discourse, which is well shadowed out by Echo or talk, or when it is more accurate, by Syrx or writing. But Echo makes a most excellent wife for Pan, as being no other than genuine philosophy, which faithfully repeats his words, or only transcribes exactly as nature dictates ; thus representing the true image and reflection of the world without adding a tittle.

It tends also to the support and perfection of Pan or nature to be without offspring ; for the world generates in its parts, and not in the way of a whole, as wanting a body external to itself wherewith to generate.

Lastly, for the supposed or spurious prattling daughter of Pan, it is

an excellent addition to the fable, and aptly represents the talkative philosophies that have at all times been stirring, and filled the world with idle tales, being ever barren, empty, and servile, though sometimes indeed diverting and entertaining, and sometimes again troublesome and importunate.



NEW ATLANTIS.

A WORK UNFINISHED.

*Written by the Right Honourable Francis Lord Verulam,
Viscount St. Albans.*



TO THE READER.

This fable my lord devised, to the end that he might exhibit therein a model or description of a college, instituted for the interpreting of nature, and the producing of great and marvellous works for the benefit of man, under the name of Solomon's House, or the College of the Six Days' Works. And even so far his lordship hath proceeded as to finish that part. Certainly the model is more vast and high than can possibly be imitated in all things, notwithstanding most things therein are within men's power to effect. His lordship thought also in this present fable to have composed a frame of laws, or the best state or mould of a commonwealth; but foreseeing it would be a long work, his desire of collecting the natural history diverted him, which he preferred many degrees before it. This work of the New Atlantis (as much as concerneth the English edition) his lordship designed for this place.

W. RAWLEY.



NEW ATLANTIS.

WE sailed from Peru, where we had continued for the space of one whole year, for China and Japan, by the South Sea, taking with us victuals for twelve months, and had good winds from the east, though soft and weak, for five months' space and more; but then the wind came about, and settled in the west for many days, so as we could make little or no way, and were sometimes in purpose to turn back. But then again there arose strong and great winds from the south, with a point east, which carried us up, for all that we could do, towards the north; by which time our victuals failed us, though we had made good spare of them. So that, finding ourselves in the midst of the greatest wilderness of waters in the world, without victuals, we gave ourselves for lost men, and prepared for death. Yet we did lift up our hearts and voices to God above, "who showeth his wonders in the deep," beseeching him of his mercy, that as in the beginning he discovered the face of the deep, and brought forth dry land, so he would now discover land to us, that we might not perish. And it came to pass that the next day about evening we saw, within a kenning

before us, towards the north, as it were, thicker clouds, which did put us in some hope of land; knowing how that part of the South Sea was utterly unknown, and might have islands or continents that hitherto were not come to light. Wherefore we bent our course thither, where we saw the appearance of land all that night; and in the dawning of the next day we might plainly discern that it was a land flat to our sight, and full of boscaje, which made it show the more dark: and after an hour and a half's sailing we entered into a good haven, being the port of a fair city, not great indeed, but well built, and that gave a pleasant view from the sea. And we, thinking every minute long till we were on land, came close to the shore, and offered to land; but straightways we saw divers of the people with bastons in their hand, as it were forbidding us to land, yet without any cries or fierceness, but only as warning us off by signs that they made. Whereupon, being not a little discomfited, we were advising with ourselves what we should do. During which time there made forth to us a small boat with about eight persons in it, whereof one of them had in his hand a tipstaff of a yellow cane, tipped at both ends with blue, who made aboard our ship without any show of distrust at all. And when he saw one of our number present himself somewhat after the rest, he drew forth a little scroll of parchment, somewhat yellower than our parchment, and shining like the leaves of writing-tables, but otherwise soft and flexible, and delivered it to our foremost man. In which scroll were written, in ancient Hebrew, and in ancient Greek, and in good Latin of the school, and in Spanish, these words, "Land ye not, none of you, and provide to be gone from this coast within sixteen days, except you have further time given you: meanwhile, if you want fresh water, or victual, or help for your sick, or that your ship needeth repair, write down your wants, and you shall have that which belongeth to mercy." This scroll was signed with a stamp of cherubim's wings, not spread, but hanging downwards, and by them a cross. This being delivered, the officer returned, and left only a servant with us to receive our answer. Consulting hereupon amongst ourselves, we were much perplexed. The denial of landing, and hasty warning us away, troubled us much. On the other side, to find that the people had languages, and were so full of humanity, did comfort us not a little; and, above all, the sign of the cross to that instrument was to us a great rejoicing, and, as it were, a certain presage of good. Our answer was in the Spanish tongue, "That for our ship it was well, for we had rather met with calms and contrary winds than any tempests. For our sick, they were many, and in very ill case, so that if they were not permitted to land, they ran in danger of their lives." Our other wants we set down in particular, adding, "That we had some little store of merchandise, which, if it pleased them to deal for, it might supply our wants without being chargeable unto them." We offered some reward in pistolets unto the servant, and a piece of crimson velvet to be presented to the officer; but the servant took them not, nor would scarce look upon them; and so left us, and went back in another little boat which was sent for him.

About three hours after we had despatched our answer, there came towards us a person, as it seemed, of place. He had on him a gown, with wide sleeves of a kind of water-chamlet, of an excellent azure colour, far more glossy than ours; his under-apparel was green, and so was his hat, being in the form of a turban, daintily made, and not so huge as the Turkish turbans; and the locks of his hair came down below the brims of it. A reverend man was he to behold. He came in a boat, gilt in some part of it, with four persons more only in that boat, and was followed by another boat, wherein were some twenty. When he was come within a flight-shot of our ship, signs were made to us that we should send forth some to meet him upon the water; which we presently did in our ship's boat, sending the principal man amongst us, save one, and four of our number with him. When we were come within six yards of their boat, they called to us to stay, and not to approach further, which we did. And thereupon the man whom I before described stood up, and with a loud voice, in Spanish, asked, "Are ye Christians?" We answered, "We were;" fearing the less because of the cross we had seen in the subscription. At which answer the said person lifted up his right hand towards heaven, and drew it softly to his mouth, which is the gesture they use when they thank God, and then said, "If you will swear, all of you, by the merits of the Saviour, that ye are no pirates, nor have shed blood, lawfully or unlawfully, within forty days past, you may have license to come on land. We said, "We were all ready to take that oath." Whereupon one of those that were with him, being, as it seemed, a notary, made an entry of this act. Which done, another of the attendants of the great person, who was with him in the same boat, after his lord had spoken a little to him, said aloud, "My lord would have you know that it is not of pride or greatness that he cometh not aboard your ship; but for that in your answer you declare that you have many sick amongst you, he was warned by the conservator of health of the city that he should keep at a distance." We bowed ourselves towards him, and answered, "We were his humble servants; and accounted for great honour and singular humanity towards us that which was already done; but hoped well that the nature of the sickness of our men was not infectious." So he returned; and a while after came the notary to us aboard our ship, holding in his hand a fruit of that country, like an orange, but of colour between orange-tawny and scarlet, which casts a most excellent odour: he used it, as it seemeth, for a preservative against infection. He gave us our oath, "By the name of Jesus and his merits;" and after told us that the next day, by six o'clock in the morning, we should be sent to, and brought to the Strangers'-House, so he called it, where we should be accommodated of things both for our whole and for our sick. So he left us; and when we offered him some pistolets, he, smiling, said, "He must not be twice paid for one labour;" meaning, as I take it, that he had salary sufficient of the state for his service; for, as I after learned, they call an officer that taketh rewards "twice paid."

The next morning early there came to us the same officer that came

to us at first with his cane, and told us, "He came to conduct us to the Strangers'-House, and that he had prevented the hour, because we might have the whole day before us for our business : for," said he, "if you will follow my advice, there shall first go with me some few of you and see the place, and how it may be made convenient for you ; and then you may send for your sick, and the rest of your number, which ye will bring on land." We thanked him, and said, "That this care which he took of desolate strangers God would reward." And so six of us went on land with him ; and when we were on land he went before us, and turned to us, and said, "He was but our servant and our guide." He led us through three fair streets, and all the way we went there were gathered some people on both sides, standing in a row, but in so civil a fashion, as if it had been not to wonder at us, but to welcome us ; and divers of them, as we passed by them, put their arms a little abroad, which is their gesture when they bid any welcome. The Strangers'-House is a fair and spacious house, built of brick, of somewhat a bluer colour than our brick, and with handsome windows, some of glass, some of a kind of cambric oiled. He brought us first into a fair parlour above-stairs, and then asked us, "What number of persons we were, and how many sick?" We answered, "We were in all, sick and whole, one-and-fifty persons, whereof our sick were seventeen." He desired us to have patience a little, and to stay till he came back to us, which was about an hour after ; and then he led us to see the chambers which were provided for us, being in number nineteen. They having cast it, as it seemeth, that four of those chambers, which were better than the rest, might receive four of the principal men of our company, and lodge them alone by themselves ; and the other fifteen chambers were to lodge us, two and two together. The chambers were handsome and cheerful chambers, and furnished civilly. Then he led us to a long gallery, like a dorture, where he showed us all along the one side (for the other side was but wall and window) seventeen cells, very neat ones, having partitions of cedar-wood. Which gallery and cells, being in all forty, many more than we needed, were instituted as an infirmary for sick persons. And he told us withal, that as many of our sick waxed well, he might be removed from his cell to a chamber ; for which purpose there were set forth ten spare chambers, besides the number we spake of before. This done, he brought us back to the parlour, and lifting up his cane a little, as they do when they give any charge or command, said to us, "Ye are to know, that the custom of the land requireth that after this day and to-morrow, which we give you for removing your people from your ship, you are to keep within doors for three days. But let it not trouble you, nor do not think yourselves restrained, but rather left to your rest and ease. You shall want nothing ; and there are six of our people appointed to attend you for any business you may have abroad." We gave him thanks with all affection and respect, and said, "God surely is manifested in this land." We offered him also twenty pistolets ; but he smiled, and only said, "What, twice paid?" and so he left us.

Soon after our dinner was served in, which was right good viands, both for bread and meat, better than any collegiate diet that I have known in Europe. We had also drink of three sorts, all wholesome and good; wine of the grape, a drink of grain, such as is with us our ale, but more clear; and a kind of cider made of a fruit of that country, a wonderful pleasing and refreshing drink. Besides, there were brought in to us great store of those scarlet oranges for our sick, which, they said, were an assured remedy for sickness taken at sea. There was given us also a box of small grey or whitish pills, which they wished our sick should take, one of the pills every night before sleep, which, they said, would hasten their recovery.

The next day, after that our trouble of carriage and removing of our men and goods out of our ship was somewhat settled and quiet, I thought good to call our company together, and when they were assembled said unto them, "My dear friends, let us know ourselves, and how it standeth with us. We are men cast on land, as Jonas was out of the whale's belly, when we were as buried in the deep. And now we are on land, we are but between death and life; for we are beyond both the Old World and New; and whether ever we shall see Europe God only knoweth: it is a kind of miracle hath brought us hither, and it must be little less that shall bring us hence. Therefore, in regard of our deliverance past, and our danger present and to come, let us look up to God, and every man reform his own ways. Besides, we are come here amongst a Christian people, full of piety and humanity; let us not bring that confusion of face upon ourselves as to show our vices or unworthiness before them. Yet there is more; for they have by commandment, though in form of courtesy, cloistered us within these walls for three days: who knoweth whether it be not to take some taste of our manners and conditions; and if they find them bad, to banish us straightways; if good, to give us further time? For these men that they have given us for attendance may withal have an eye upon us. Therefore for God's love, and as we love the weal of our souls and bodies, let us so behave ourselves as we may be at peace with God, and may find grace in the eyes of this people." Our company with one voice thanked me for my good admonition, and promised me to live soberly and civilly, and without giving any the least occasion of offence. So we spent our three days joyfully, and without care, in expectation what would be done with us when they were expired; during which time we had every hour joy of the amendment of our sick, who thought themselves cast into some divine pool of healing, they mended so kindly and so fast.

The morrow after our three days were past, there came to us a new man that we had not seen before, clothed in blue as the former was, save that his turban was white, with a small red cross on the top; he had also a tippet of fine linen. At his coming in he did bend to us a little, and put his arms abroad. We of our parts saluted him in a very lowly and submissive manner, as looking that from him we should receive sentence of life or death. He desired to speak with some few of us; whereupon six of us only stayed, and the rest avoided the

room. He said, "I am by office governor of this House of Strangers, and by vocation I am a Christian priest, and therefore am come to offer you my service both as strangers, and chiefly as Christians. Some things I may tell you, which I think you will not be unwilling to hear. The state hath given you license to stay on land for the space of six weeks. And let it not trouble you if your occasions ask further time, for the law in this point is not precise; and I do not doubt but myself shall be able to obtain for you such further time as shall be convenient. Ye shall also understand that the Strangers'-House is at this time rich and much aforehand, for it hath laid up revenue these thirty-seven years; for so long it is since any stranger arrived in this part. And, therefore, take ye no care, the state will defray you all the time you stay, neither shall you stay one day less for that. As for any merchandise you have brought, ye shall be well used, and have your return either in merchandise, or in gold and silver; for to us it is all one. And if you have any other request to make, hide it not, for ye shall find we will not make your countenance to fall by the answer ye shall receive. Only this I must tell you, that none of you must go above a karan [that is with them a mile and a half] from the walls of the city without special leave." We answered, after we had looked awhile upon one another, admiring this gracious and parent-like usage, "That we could not tell what to say, for we wanted words to express our thanks, and his noble free offers left us nothing to ask. It seemed to us that we had before us a picture of our salvation in heaven; for we that were awhile since in the jaws of death, were now brought into a place where we found nothing but consolations. For the commandment laid upon us, we would not fail to obey it, though it was impossible but our hearts should be inflamed to tread further upon this happy and holy ground." We added, "That our tongues should first cleave to the roofs of our mouths ere we should forget either this reverend person, or this whole nation in our prayers." We also most humbly besought him to accept of us as his true servants, by as just a right as ever men on earth were bounden, laying and presenting both our persons and all we had at his feet. He said, "He was a priest, and looked for a priest's reward, which was our brotherly love, and the good of our souls and bodies." So he went from us, not without tears of tenderness in his eyes; and left us also confused with joy and kindness, saying amongst ourselves, "That we were come into a land of angels which did appear to us daily, and present us with comforts which we thought not of, much less expected."

The next day, about ten o'clock, the governor came to us again, and after salutations said familiarly, "That he was come to visit us," and called for a chair, and sat him down: and being some ten of us (the rest were of the meaner sort, or else gone abroad), sat down with him. And when we were seated, he began thus, "We of this island of Bensalem [for so they call it in their language] have this, that by means of our solitary situation, and the laws of secrecy which we have for our travellers, and our rare admission of strangers, we know well most part of the habitable world, and are ourselves unknown. There-

fore, because he that knoweth least is fittest to ask questions, it is more reason, for the entertainment of the time, that ye ask me questions than that I ask you." We answered, "That we humbly thanked him that he would give us leave so to do, and that we conceived, by the taste we had already, that there was no worldly thing on earth more worthy to be known than the state of that happy land. But above all," we said, "since that we were met from the several ends of the world, and hoped assuredly that we should meet one day in the kingdom of heaven, for that we were both parts Christians, we desired to know, in respect that land was so remote, and so divided by vast and unknown seas from the land where our Saviour walked on earth, who was the apostle of that nation, and how it was converted to the faith?" It appeared in his face that he took great contentment in this our question. He said, "Ye knit my heart to you by asking this question in the first place, for it sheweth that you 'first seek the kingdom of heaven;' and I shall gladly and briefly satisfy your demand:—

"About twenty years after the ascension of our Saviour, it came to pass that there was seen by the people of Rensua, a city upon the eastern coast of our island, within night, the night was cloudy and calm, as it might be some miles in the sea, a great pillar of light, not sharp, but in form of a column or cylinder, rising from the sea, a great way up towards heaven, and on the top of it was seen a large cross of light, more bright and resplendent than the body of the pillar: upon which so strange a spectacle the people of the city gathered apace together upon the sands to wonder, and so after put themselves into a number of small boats to go nearer to this marvellous sight. But when the boats were come within about sixty yards of the pillar, they found themselves all bound, and could go no further, yet so as they might move to go about, but might not approach nearer; so as the boats stood all as in a theatre, beholding this sight as a heavenly sign. It so fell out that there was in one of the boats of the wise men of the Society of Solomon's House (which house or college, my good brethren, is the very eye of this kingdom), who having a while attentively and devoutly viewed and contemplated this pillar and cross, fell down upon his face, and then raised himself upon his knees, and lifting up his hands to heaven, made his prayers in this manner:—

"'Lord God of heaven and earth, thou hast vouchsafed of thy grace to those of our order to know thy works of creation, and the secrets of them, and to discern as far as appertaineth to the generations of men between divine miracles, works of nature, works of art, and impostures and illusions of all sorts! I do here acknowledge and testify before this people, that the thing we now see before our eyes is thy finger and a true miracle. And forasmuch as we learn in our books that thou never workest miracles but to a divine and excellent end, for the laws of nature are thine own laws, and thou exceedest them not but upon good cause, we most humbly beseech thee to prosper this great sign, and to give us the interpretation and use of it in mercy, which thou dost in some part secretly promise by sending it unto us.'

"When he had made his prayer, he presently found the boat he was in moveable and unbound, whereas all the rest remained still fast ; and taking that for an assurance of leave to approach, he caused the boat to be softly and with silence rowed towards the pillar : but ere he came near it, the pillar and cross of light brake up, and cast itself abroad, as it were, into a firmament of many stars ; which also vanished soon after, and there was nothing left to be seen but a small ark or chest of cedar, dry, and not wet at all with water, though it swam ; and in the fore-end of it, which was towards him, grew a small green branch of palm. And when the wise man had taken it with all reverence into his boat, it opened of itself, and there was found in it a book and a letter, both written in fine parchment, and wrapped in sindons of linen. The book contained all the canonical books of the Old and New Testament, according as you have them, for we know well what the churches with you receive, and the Apocalypse itself ; and some other books of the New Testament which were not at that time written, were nevertheless in the book. And for the letter, it was in these words :—

"I, Bartholomew, a servant of the Highest, and apostle of Jesus Christ, was warned by an angel that appeared to me in a vision of glory, that I should commit this ark to the floods of the sea. Therefore I do testify and declare unto that people where God shall ordain this ark to come to land, that in the same day is come unto them salvation, and peace, and goodwill from the Father, and from the Lord Jesus."

"There were also in both these writings, as well the book as the letter, wrought a great miracle, conformable to that of the apostles in the original gift of tongues. For there being at that time in this land Hebrews, Persians, and Indians, besides the natives, every one read upon the book and letter as if they had been written in his own language. And thus was this land saved from infidelity, as the remain of the old world was from water, by an ark, through the apostolical and miraculous evangelism of St. Bartholomew." And here he paused, and a messenger came and called him forth from us. So this was all that passed in that conference.

The next day the same governor came again to us immediately after dinner, and excused himself, saying, "That the day before he was called from us somewhat abruptly, but now he would make us amends, and spend some time with us, if we held his company and conference agreeable." We answered, "That we held it so agreeable and pleasing to us, as we forgot both dangers past and fears to come, for the time we heard him speak, and that we thought an hour spent with him was worth ten years of our former life." He bowed himself a little to us, and after we were set again he said, "Well, the questions are on your part." One of our number said, after a little pause, "There was a matter we were no less desirous to know than fearful to ask, lest we might presume too far ; but encouraged by his rare humanity towards us, that we could scarce think ourselves strangers, being his vowed and professed servants, we would take the hardiness to pro-

pound it : humbly beseeching him, if he thought it not fit to be answered, that he would pardon it, though he rejected it." We said, "We well observed those his words which he formerly spake, that this happy island where we now stood was known to few, and yet knew most of the nations of the world ; which we found to be true, considering they had the languages of Europe, and knew much of our state and business ; and yet we in Europe, notwithstanding all the remote discoveries and navigations of this last age, never heard any of the least inkling or glimpse of this island. This we found wonderful strange, for that all nations have interknowledge one of another, either by voyage into foreign parts, or by strangers that come to them : and though the traveller into a foreign country doth commonly know more by the eye than he that stayeth at home can by relation of the traveller, yet both ways suffice to make a mutual knowledge in some degree on both parts. But for this island, we never heard tell of any ship of theirs that had been seen to arrive upon any shore of Europe, no, nor of either the East or West Indies, nor yet of any ship of any other part of the world that had made return from them. And yet the marvel rested not in this, for the situation of it, as his lordship said, in the secret conclave of such a vast sea, might cause it : but then, that they should have knowledge of the languages, books, affairs of those that lie such a distance from them, it was a thing we could not tell what to make of ; for that it seemed to us a condition and property of divine powers and beings, to be hidden and unseen to others, and yet to have others open and as in a light to them." At this speech the governor gave a gracious smile, and said, "That we did well to ask pardon for this question we now asked, for that it imported as if we thought this land a land of magicians, that sent forth spirits of the air into all parts to bring them news and intelligence of other countries." It was answered by us all in all possible humbleness, but yet with a countenance taking knowledge that we knew that he spake it but merrily, "That we were apt enough to think there was somewhat supernatural in this island, but yet rather as angelical than magical. But to let his lordship know truly what it was that made us tender and doubtful to ask this question, it was not any such conceit, but because we remembered he had given a touch in his former speech, that this land had laws of secrecy touching strangers." To this he said, "You remember it right ; and therefore in that I shall say to you, I must reserve some particulars, which it is not lawful for me to reveal ; but there will be enough left to give you satisfaction.

"You shall understand, that which perhaps you will scarce think credible, that about three thousand years ago, or somewhat more, the navigation of the world, especially for remote voyages, was greater than at this day. Do not think with yourselves that I know not how much it is increased with you within these sixscore years ; I know it well : and yet I say, greater then than now. Whether it was that the example of the ark that saved the remnant of men from the universal deluge, gave men confidence to adventure upon the waters, or what it

was, but such is the truth. The Phœnicians, and especially the Tyrians, had great fleets ; so had the Carthaginians their colony, which is yet further west. Toward the east the shipping of Egypt and of Palestine was likewise great ; China also, and the great Atlantis, that you call America, which have now but junks and canoes, abounded then in tall ships. This island, as appeareth by faithful registers of those times, had then fifteen hundred strong ships of great content. Of all this there is with you sparing memory, or none ; but we have large knowledge thereof.

“At that time, this land was known and frequented by the ships and vessels of all the nations before named, and, as it cometh to pass, they had many times men of other countries that were no sailors that came with them ; as Persians, Chaldeans, Arabians ; so as almost all nations of might and fame resorted hither, of whom we have some stirps and little tribes with us at this day. And for our own ships, they went sundry voyages. as well to your straits, which you call the Pillars of Hercules, as to other parts in the Atlantic and Mediterranean Seas ; as to Pegu, in which is the same with Cambaline, and Quinzy upon the Oriental seas, as far as to the borders of East Tartary.

“At the same time, and an age after or more, the inhabitants of the great Atlantis did flourish. For though the narration and description which is made by a great man, with you, of the descendants of Neptune planted there, and of the magnificent temple, palace, city, and hill, and the manifold streams of goodly navigable rivers, which, as so many chains, environed the same sight and temple, and the several degrees of ascent, whereby men did climb up to the same, as if it had been a scala cœli, be all poetical and fabulous ; yet so much is true, that the said country of Atlantis, as well as that of Peru, then called Coya, as that of Mexico, then named Tyrambel, were mighty and proud kingdoms in arms, shipping, and riches ; so mighty, as at one time, or at least within the space of ten years, they both made two great expeditions ; they of Tyrambel through the Atlantic to the Mediterranean Sea, and they of Coya, through the South Sea, upon this our island. And for the former of these, which was into Europe, the same author amongst you, as it seemeth, had some relation from the Egyptian priest whom he citeth, for assuredly such a thing there was. But whether it were the ancient Athenians that had the glory of the repulse and resistance of those forces, I can say nothing ; but certain it is, there never came back either ship or man from that voyage. Neither had the other voyage of those of Coya upon us had better fortune, if they had not met with enemies of greater clemency. For the king of this island, by name Altabin, a wise man and a great warrior, knowing well both his own strength and that of his enemies, handled the matter so, as he cut off their land-forces from their ships, and entailed both their navy and their camp with a greater power than theirs, both by sea and land, and compelled them to render themselves without striking stroke ; and after they were at his mercy, contenting himself only with their oath that they should no more bear arms against him, dismissed

them all in safety. But the Divine revenge overtook not long after those proud enterprises ; for within less than the space of one hundred years, the great Atlantis was utterly lost and destroyed, not by a great earthquake, as your man saith, for that whole tract is little subject to earthquakes, but by a particular deluge or inundation, those countries having at this day far greater rivers, and far higher mountains to pour down waters, than any part of the old world. But it is true, that the same inundation was not deep ; not past forty foot in most places from the ground : so that although it destroyed man and beast generally, yet some few wild inhabitants of the wood escaped. Birds also were saved by flying to the high trees and woods. For as for men, although they had buildings in many places higher than the depth of the water, yet that inundation, though it were shallow, had a long continuance, whereby they of the vale that were not drowned, perished for want of food, and other things necessary. So as marvel you not at the thin population of America, nor at the rudeness and ignorance of the people ; for you must account your inhabitants of America as a young people, younger a thousand years at the least than the rest of the world, for that there was so much time between the universal flood and their particular inundation. For the poor remnant of human seed which remained in their mountains, peopled the country again slowly by little and little ; and being simple and a savage people, not like Noah and his sons, which was the chief family of the earth, they were not able to leave letters, arts, and civility to their posterity. And having likewise, in their mountainous habitations, been used, in respect of the extreme cold of those regions, to clothe themselves with the skins of tigers, bears, and great hairy goats that they have in those parts ; when, after they came down into the valley, and found the intolerable heats which are there, and knew no means of lighter apparel, they were forced to begin the custom of going naked, which continueth at this day : only they take great pride and delight in the feathers of birds ; and this also they took from those their ancestors of the mountains, who were invited unto it by the infinite flight of birds that came up to the high grounds while the waters stood below. So you see by this main accident of time we lost our traffic with the Americans, with whom, of all others, in regard they lay nearest to us, we had most commerce. As for the other parts of the world, it is most manifest that in the ages following, whether it were in respect of wars, or by a natural revolution of time, navigation did everywhere greatly decay, and especially far voyages, the rather by the use of galleys and such vessels as could hardly brook the ocean, were altogether left and omitted. So then, that part of the intercourse which could be from other nations to sail to us, you see how it hath long since ceased, except it were by some rare accident, as this of yours. But now of the cessation of that other part of intercourse, which might be by our sailing to other nations, I must yield you some other cause ; for I cannot say, if I shall say truly, but our shipping for number, strength, mariners, pilots, and all things that appertain to navigation, is as great as ever ; and therefore why we should sit at home I shall now give you an account by itself,

and it will draw nearer to give you satisfaction to your principal question.

“There reigned in this island, about nineteen hundred years ago, a king, whose memory of all others we most adore, not superstitiously, but as a divine instrument, though a mortal man : his name was Solomona, and we esteem him as the lawgiver of our nation. This king had a large heart, inscrutable for good, and was wholly bent to make his kingdom and people happy. He therefore, taking into consideration how sufficient and substantive this land was to maintain itself without any aid at all of the foreigner, being five thousand six hundred miles in circuit, and of rare fertility of soil in the greatest part thereof ; and finding also the shipping of this country might be plentifully set on work, both by fishing and by transportations from port to port, and likewise by sailing unto some small islands that are not far from us, and are under the crown and laws of this state, and recalling into his memory the happy and flourishing estate wherein this land then was, so as it might be a thousand ways altered to the worse, but scarce any one way to the better ; thought nothing wanted to his noble and heroical intentions, but only, as far as human foresight might reach, to give perpetuity to that which was in his time so happily established ; therefore amongst his other fundamental laws of this kingdom he did ordain the interdicts and prohibitions which we have touching the entrance of strangers, which at that time, though it was after the calamity of America, was frequent ; doubting novelties and commixture of manners. It is true, the like law against the admission of strangers without licence is an ancient law in the kingdom of China, and yet continued in use ; but there it is a poor thing, and hath made them a curious, ignorant, fearful, foolish nation. But our lawgiver made his law of another temper. For, first, he hath preserved all points of humanity, in taking order and making provision for the relief of strangers distressed, whereof you have tasted.” At which speech, as reason was, we all rose up and bowed ourselves. He went on. “That king also—still desiring to join humanity and policy together, and thinking it against humanity to detain strangers here against their wills, and against policy, that they should return and discover their knowledge of this state, he took this course. He did ordain, that of the strangers that should be permitted to land, as many, at all times, might depart as would, but as many as would stay should have very good conditions and means to live from the state. Wherein he saw so far, that now in so many ages since the prohibition, we have memory not of one ship that ever returned, and but of thirteen persons only at several times that chose to return in our bottoms. What those few that returned may have reported abroad, I know not ; but you must think, whatsoever they have said could be taken where they came but for a dream. Now for our travelling from hence into parts abroad, our lawgiver thought fit altogether to restrain it. So is it not in China, for the Chinese sail where they will, or can ; which sheweth that their law of keeping out strangers is a law of pusillanimity and fear. But this restraint of ours hath one only exception, which is

admirable, preserving the good which cometh by communicating with strangers, and avoiding the hurt; and I will now open it to you. And here I shall seem a little to digress, but you will, by-and-by, find it pertinent. You shall understand, my dear friends, that amongst the excellent acts of that king, one above all hath the pre-eminence; it was the erection and institution of an order or society, which we call Solomon's House, the noblest foundation, as we think, that ever was upon the earth, and the lanthorn of this kingdom. It is dedicated to the study of the works and creatures of God. Some think it beareth the founder's name a little corrupted, as if it should be Solomona's House; but the records write it as it is spoken. So as I take it to be denominate of the king of the Hebrews, which is famous with you, and no stranger to us, for we have some parts of his works which with you are lost; namely, that natural history which he wrote of all plants, 'from the cedar of Libanus to the moss that groweth out of the wall,' and of all things that have life and motion. This maketh me think that our king, finding himself to symbolize in many things with that king of the Hebrews which lived many years before him, honoured him with the title of this foundation. And I am the rather induced to be of this opinion, for that I find in ancient records this order or society is sometimes called Solomon's House, and sometimes the College of the Six Days' Works; whereby I am satisfied that our excellent king had learned from the Hebrews that God had created the world, and all that therein is, within six days, and therefore he instituting that house for the finding out of the true nature of all things, whereby God might have the more glory in the workmanship of them, and men the more fruit in their use of them, did give it also that second name. But now, to come to our present purpose. When the king had forbidden to all his people navigation in any part that was not under his crown, he made nevertheless this ordinance, that every twelve years there should be set forth out of this kingdom two ships appointed to several voyages; that in either of these ships there should be a mission of three of the fellows or brethren of Solomon's House, whose errand was only to give us knowledge of the affairs and state of those countries to which they were designed, and especially of the sciences, arts, manufactures, and inventions of all the world; and withal to bring unto us books, instruments, and patterns in every kind: that the ships, after they had landed the brethren, should return, and that the brethren should stay abroad till the new mission. The ships are not otherwise fraught than with store of victuals, and good quantity of treasure, to remain with the brethren for the buying of such things and rewarding of such persons as they should think fit. Now for me to tell you, how the vulgar sort of mariners are contained from being discovered at land, and how they that must be put on shore for any time, colour themselves under the names of other nations, and to what places these voyages have been designed, and what places of rendezvous are appointed for the new missions, and the like circumstances of the practice, I may not do it, neither is it much to your desire. But thus you see we maintain a trade, not for gold, silver, or jewels, nor

for silks, nor for spices, nor any other commodity of matter, but only for God's first creature, which was light; to have light, I say, of the growth of all parts of the world."

And when he had said this he was silent, and so were we all; for indeed we were all astonished to hear so strange things so probably told. And he, perceiving that we were willing to say somewhat, but had it not ready, in great courtesy took us off, and descended to ask us questions of our voyage and fortunes; and in the end concluded, that we might do well to think with ourselves what time of stay we would demand of the state; and bade us not to scant ourselves, for he would procure such time as we desired. Whereupon we all rose up, and presented ourselves to kiss the skirt of his tippet; but he would not suffer us, and so took his leave. But when it came once amongst our people, that the state used to offer conditions to strangers that would stay, we had work enough to get any of our men to look to our ship, and to keep them from going presently to the governor to crave conditions; but with much ado we refrained them, till we might agree what course to take.

We took ourselves now for free men, seeing there was no danger of our utter perdition, and lived most joyfully, going abroad, and seeing what was to be seen in the city and places adjacent within our tedder, and obtaining acquaintance with many of the city, not of the meanest quality, at whose hands we found such humanity, and such a freedom and desire to take strangers as it were into their bosom, as was enough to make us forget all that was dear to us in our own countries; and continually we met with many things right worthy of observation and relation; as indeed, if there be a mirror in the world worthy to hold men's eyes, it is that country. One day there were two of our company bidden to a feast of the family, as they call it; a most natural, pious, and reverend custom it is, showing that nation to be compounded of all goodness. This is the manner of it: it is granted to any man that shall live to see thirty persons descended of his body alive together, and all above three years old, to make this feast, which is done at the cost of the state. The father of the family, whom they call the Tirsan, two days before the feast, taketh to him three of such friends as he liketh to choose, and is assisted also by the governor of the city or place where the feast is celebrated; and all the persons of the family of both sexes are summoned to attend him. These two days the Tirsan sitteth in consultation concerning the good estate of the family. There, if there be any discord or suits between any of the family, they are compounded and appeased; there, if any of the family be distressed or decayed, order is taken for their relief, and competent means to live; there, if any be subject to vice or take ill courses, they are reprov'd and censured. So likewise, direction is given touching marriages, and the courses of life which any of them should take, with divers other the like orders and advices. The governor assisteth to the end, to put in execution by his public authority the decrees and orders of the Tirsan, if they should be disobeyed, though that seldom needeth, such reverence and obedience they give

to the order of nature. The Tirsan doth also then ever choose one man from amongst his sons to live in house with him, who is called ever after the son of the vine : the reason will hereafter appear. On the feast-day, the father or Tirsan cometh forth, after divine service, into a large room where the feast is celebrated, which room hath an half-pace at the upper end. Against the wall, in the middle of the half-pace, is a chair placed for him, with a table and carpet before it ; over the chair is a state made round or oval, and it is of ivy ; an ivy somewhat whiter than ours, like the leaf of a silver asp, but more shining, for it is green all winter. And the state is curiously wrought with silver and silk of divers colours, broiding or binding in the ivy, and is ever of the work of some of the daughters of the family, and veiled over at the top with a fine net of silk and silver : but the substance of it is true ivy, whereof, after it is taken down, the friends of the family are desirous to have some leaf or sprig to keep. The Tirsan cometh forth with all his generation or lineage, the males before him, and the females following him. And if there be a mother from whose body the whole lineage is descended, there is a traverse placed in a loft above on the right hand of the chair, with a private door, and a carved window of glass, leaded with gold and blue, where she sitteth, but is not seen. When the Tirsan is come forth, he sitteth down in the chair, and all the lineage place themselves against the wall, both at his back, and upon the return of the half-pace, in order of their years, without difference of sex, and stand upon their feet. When he is set, the room being always full of company, but well kept, and without disorder, after some pause there cometh in from the lower end of the room a taratan, which is as much as an herald, and on either side of him two young lads, whereof one carrieth a scroll of their shining yellow parchment, and the other a cluster of grapes of gold, with a long foot or stalk ; the herald and children are clothed with mantles of sea-water green satin, but the herald's mantle is streamed with gold, and hath a train. Then the herald, with three courtesies, or rather inclinations, cometh up as far as the half-pace, and there first taketh into his hand the scroll. This scroll is the king's charter, containing gift of revenue, and many privileges, exemptions, and points of honour granted to the father of the family ; and it is ever styled and directed, to such an one, our well-beloved friend and creditor, which is a title proper only to this case ; for they say, the king is debtor to no man, but for propagation of his subjects. The seal set to the king's charter is the king's image, embossed or moulded in gold. And though such charters be expedited of course, and as of right, yet they are varied by discretion, according to the number and dignity of the family. This charter the herald readeth aloud ; and while it is read, the father or Tirsan standeth up, supported by two of his sons, such as he chooseth. Then the herald mounteth the half-pace, and delivereth the charter into his hand, and with that there is an acclamation by all that are present, in their language, which is thus much, " Happy are the people of Bensalem." Then the herald taketh into his hand from the other child the cluster of grapes, which is of

gold, both the stalks and the grapes, but the grapes are daintily enamelled; and if the males of the family be the greater number, the grapes are enamelled purple, with a little sun set on the top; if the females, then they are enamelled into a greenish yellow, with a crescent on the top. The grapes are in number as many as there are descendants of the family. This golden cluster the herald delivereth also to the Tirsan, who presently delivereth it over to that son that he had formerly chosen to be in house with him, who beareth it before his father, as an ensign of honour when he goeth in public ever after, and is thereupon called the son of the vine. After this ceremony ended, the father or Tirsan retireth, and after some time cometh forth again to dinner, where he sitteth alone under the state as before; and none of his descendants sit with him, of what degree or dignity soever, except he hap to be of Solomon's House. He is served only by his own children, such as are male, who perform unto him all service of the table upon the knee, and the women only stand about him, leaning against the wall. The room below his half-pace hath tables on the sides for the guests that are bidden, who are served with great and comely order; and toward the end of dinner, which in the greatest feasts with them lasteth never above an hour and a half, there is a hymn sung, varied according to the invention of him that composed it, for they have excellent poetry, but the subject of it is always the praises of Adam, and Noah, and Abraham; whereof the former two peopled the world, and the last was the father of the faithful: concluding ever with a thanksgiving for the nativity of our Saviour, in whose birth the births of all are only blessed. Dinner being done, the Tirsan retireth again, and having withdrawn himself alone into a place where he maketh some private prayers, he cometh forth the third time to give the blessing, with all his descendants, who stand about him as at the first. Then he calleth them forth one by one, by name, as he pleaseth, though seldom the order of age be inverted. The person that is called, the table being before removed, kneeleth down before the chair, and the father layeth his hand upon his head, or her head, and giveth the blessing in these words: "Son of Bensalem, or daughter of Bensalem, thy father saith it, the man by whom thou hast breath and life speaketh the word; the blessing of the everlasting Father, the Prince of Peace, and the Holy Dove be upon thee, and make the days of thy pilgrimage good and many." This he saith to every of them: and that done, if there be any of his sons of eminent merit and virtue, so they be not above two, he calleth for them again, and sayeth, laying his arm over their shoulders, they standing, "Sons, it is well you are born; give God the praise, and persevere to the end:" and withal delivereth to either of them a jewel, made in the figure of an ear of wheat, which they ever after wear in the front of their turban or hat. This done, they fall to music and dances, and other recreations after their manner, for the rest of the day. This is the full order of that feast.

By that time six or seven days were spent, I was fallen into strait acquaintance with a merchant of that city, whose name was Joabin;

he was a Jew, and circumcised, for they have some few stirps of Jews yet remaining among them, whom they leave to their own religion, which they may the better do, because they are of a far different disposition from the Jews in other parts. For whereas they hate the name of Christ, and have a secret inbred rancour against the people among whom they live; these contrariwise give unto our Saviour many high attributes, and love the nation of Bensalem extremely. Surely this man of whom I speak, would ever acknowledge that Christ was born of a virgin, and that he was more than a man; and he would tell how God made him ruler of the seraphims which guard his throne: and they call him also the Milken Way, and the Eliah of the Messiah, and many other high names; which, though they be inferior to his Divine Majesty, yet they are far from the language of other Jews. And for the country of Bensalem, this man would make no end of commending it, being desirous, by tradition among the Jews there, to have it believed, that the people thereof were of the generations of Abraham by another son, whom they called Nachoran; and that Moses by a secret cabala ordained the laws of Bensalem, which they now use; and that when the Messiah should come and sit in his throne at Jerusalem, the king of Bensalem should sit at his feet, whereas other kings should keep at a great distance. But yet, setting aside these Jewish dreams, the man was a wise man and learned, and of great policy, and excellently seen in the laws and customs of that nation. Amongst other discourses, one day I told him, I was much affected with the relation I had from some of the company, of their custom in holding the feast of the family, for that methought I had never heard of a solemnity wherein nature did so much preside. And because propagation of families proceedeth from the nuptial copulation, I desired to know of him what laws and customs they had concerning marriage, and whether they kept marriage well, and whether they were tied to one wife. For that where population is so much affected, and such as with them it seemed to be, there is commonly permission of plurality of wives. To this he said, "You have reason to commend that excellent institution of the feast of the family; and indeed we have experience that those families that are partakers of the blessings of that feast do flourish and prosper ever after in an extraordinary manner. But hear me now, and I will tell you what I know. You shall understand that there is not under the heavens so chaste a nation as this of Bensalem, nor so free from all pollution or foulness; it is the virgin of the world. I remember I have read in one of your European books, of an holy hermit amongst you that desired to see the spirit of fornication, and there appeared to him a little foul ugly Ethiop. But if he had desired to see the spirit of chastity of Bensalem, it would have appeared to him in the likeness of a fair beautiful cherubim; for there is nothing amongst mortal men more fair and admirable than the chaste minds of this people. Know, therefore, that with them there are no stews, no dissolute houses, no courtezans, nor anything of that kind; nay, they wonder with detestation at you in Europe which permit such things. They say you have put

marriage out of office ; for marriage is ordained a remedy for unlawful concupiscence, and natural concupiscence seemeth as a spur to marriage ; but when men have at hand a remedy more agreeable to their corrupt will, marriage is almost expelled. And therefore there are with you seen infinite men that marry not, but choose rather a libertine and impure single life than to be yoked in marriage ; and many that do marry, marry late, when the prime and strength of their years is past ; and when they do marry, what is marriage to them but a very bargain, wherein is sought alliance, or portion, or reputation, with some desire almost indifferent of issue, and not the faithful nuptial union of man and wife that was first instituted. Neither is it possible that those who have cast away so basely so much of their strength, should greatly esteem children, being of the same matter, as chaste men do. So neither during marriage is the case much amended, as it ought to be if those things were tolerated only for necessity. No, but they remain still as a very affront to marriage ; the haunting of those dissolute places, or resort to courtezans, is no more punished in married men than in bachelors : and the depraved custom of change, and the delight in meretricious embracements, where sin is turned into art, maketh marriage a dull thing, and a kind of imposition or tax. They hear you defend these things as done to avoid greater evils, as advoutries, deflowering of virgins, unnatural lust, and the like : but they say this is a preposterous wisdom, and they call it Lot's offer, who, to save his guests from abusing, offered his daughters. Nay, they say further, that there is little gained in this, for that the same vices and appetites do still remain and abound, unlawful lust being like a furnace, that if you stop the flames altogether, it will quench, but if you give it any vent, it will rage. As for masculine love, they have no touch of it ; and yet there are not so faithful and inviolate friendships in the world again as are there : and to speak generally, as I said before, I have not read of any such chastity in any people as theirs. And their usual saying is, that whosoever is unchaste cannot reverence himself. And they say, that the reverence of a man's self is, next religion, the chiefest bridle of all vices." And when he had said this, the good Jew paused a little. Whereupon I, far more willing to hear him speak on than to speak myself, yet thinking it decent that upon his pause of speech I should not be altogether silent, said only this, "That I would say to him as the widow of Sarepta said to Elias, that he was come to bring to memory our sins ; and that I confess the righteousness of Bensalem was greater than the righteousness of Europe." At which speech he bowed his head, and went on in this manner : "They have also many wise and excellent laws touching marriage. They allow no polygamy. They have ordained that none do intermarry or contract until a month be past from their first interview. Marriage without consent of parents they do not make void, but they mulct it in the inheritors ; for the children of such marriages are not admitted to inherit above a third part of their parent's inheritance. I have read in a book of one of your men of a feigned commonwealth, where the married couple are permitted, before they contract,

to see one another naked. This they dislike, for they think it a scorn to give a refusal after so familiar knowledge : but because of many hidden defects in men and women's bodies, they have a more civil way ; for they have near every town a couple of pools, which they call Adam and Eve's pools, where it is permitted to one of the friends of the man, and another of the friends of the woman, to see them severally bathe naked."

And as we were thus in conference, there came one that seemed to be a messenger, in a rich huke, that spake with the Jew ; whereupon, he turned to me, and said, " You will pardon me, for I am commanded away in haste."

The next morning he came to me again, joyful, as it seemed, and said, " There is word come to the governor of the city, that one of the fathers of Solomon's House will be here this day seven-night ; we have seen none of them this dozen years. His coming is in state, but the cause of his coming is secret. I will provide you and your fellows of a good standing to see his entry." I thanked him, and told him, " I was most glad of the news."

The day being come, he made his entry. He was a man of middle stature and age, comely of person, and had an aspect as if he pitied men. He was clothed in a robe of fine black cloth, with wide sleeves and a cape : his under-garment was of excellent white linen down to the foot, girt with a girdle of the same, and a sindon or tippet of the same about his neck : he had gloves that were curious, and set with stone, and shoes of peach-coloured velvet ; his neck was bare to the shoulders : his hat was like a helmet or Spanish montera, and his locks curled below it decently,—they were of colour brown : his beard was cut round, and of the same colour with his hair, somewhat lighter. He was carried in a rich chariot, without wheels, litter-wise, with two horses at either end, richly trapped in blue velvet, embroidered, and two footmen on either side in the like attire. The chariot was all of cedar, gilt, and adorned with crystal, save that the fore-end had panels of sapphires set in borders of gold, and the hinder end the like of emeralds of the Peru colour. There was also a sun of gold, radiant upon the top, in the midst ; and on the top before a small cherub of gold, with wings displayed. The chariot was covered with cloth of gold, tissued upon blue. He had before him fifty attendants, young men all, in white satin loose coats up to the mid-leg, and stockings of white silk, and shoes of blue velvet, and hats of blue velvet, with fine plumes of divers colours set round like hatbands. Next before the chariot went two men bareheaded, in linen garments down to the foot, girt, and shoes of blue velvet, who carried the one a crosier, the other a pastoral staff, like a sheep-hook : neither of them of metal, but the crosier of balm-wood, the pastoral staff of cedar. Horsemen he had none, neither before nor behind his chariot, as it seemeth, to avoid all tumult and trouble. Behind his chariot went all the officers and principals of the companies of the city. He sat alone upon cushions of a kind of excellent plush, blue, and under his foot curious carpets of silk of divers colours, like the Persian, but far finer. He held up his

bare hand as he went, as blessing the people, but in silence. The street was wonderfully well kept; so that there was never an army had their men stand in better battle-array than the people stood. The windows likewise were not crowded, but every one stood in them as if they had been placed. When the show was past, the Jew said to me, "I shall not be able to attend you as I would, in regard of some charge the city hath laid upon me, for the entertaining of this great person."

Three days after, the Jew came to me again, and said, "Ye are happy men! for the father of Solomon's House taketh knowledge of your being here, and commanded me to tell you, that he will admit all your company to his presence, and have private conference with one of you that ye shall choose; and for this hath appointed the day next after to-morrow. And, because he meaneth to give you his blessing, he hath appointed it in the forenoon."

We came at our day and hour, and I was chosen by my fellows for the private access. We found him in a fair chamber, richly hung, and carpeted under-foot, without any degrees to the state. He was seated upon a low throne, richly adorned, and a rich cloth of state over his head, of blue satin, embroidered. He was alone, save that he had two pages of honour, on either hand, one finely attired in white. His under-garments were the like that we saw him wear in the chariot; but instead of his gown, he had on him a mantle, with a cape of the same fine black, fastened about him. When we came in, as we were taught, we bowed low at our first entrance; and when we were come near his chair, he stood up, holding forth his hand ungloved, and in posture of blessing; and we every one of us stooped down and kissed the hem of his tippet. That done, the rest departed, and I remained. Then he warned the pages forth of the room, and caused me to sit down beside him, and spake to me thus in the Spanish tongue:—

"God bless thee, my son, I will give thee the greatest jewel I have: for I will impart unto thee, for the love of God and men, a relation of the true state of Solomon's House. Son, to make you know the true state of Solomon's House, I will keep this order:—first, I will set forth unto you the end of our foundation; secondly, the preparations and instruments we have for our works; thirdly, the several employments and functions whereto our fellows are assigned; and fourthly the ordinances and rites which we observe.

"The end of our foundation is the knowledge of causes and secret motions of things, and the enlarging of the bounds of human empire, to the effecting of all things possible.

"The preparations and instruments are these. We have large and deep caves of several depths: the deepest are sunk six hundred fathoms, and some of them are digged and made under great hills and mountains; so that if you reckon together the depth of the hill and the depth of the cave, they are some of them above three miles deep: for we find that the depth of a hill and the depth of a cave from the flat is the same thing, both remote alike from the sun and heaven's beams and from the open air. These caves we call 'the lower region,'

and we use them for all coagulations, indurations, refrigerations, and conservations of bodies. We use them likewise for the imitation of natural mines, and the producing also of new artificial metals, by compositions and materials which we use and lay there for many years. We use them also sometimes, which may seem strange, for curing of some diseases, and for prolongation of life in some hermits that choose to live there, well accommodated of all things necessary, and, indeed, live very long ; by whom also we learn many things.

“We have burials in several earths, where we put divers cements, as the Chinese do their porcelain ; but we have them in greater variety, and some of them finer. We also have great variety of composts and soils for making of the earth fruitful.

“We have high towers, the highest about half a mile in height, and some of them likewise set upon high mountains ; so that the advantage of the hill with the tower is, in the highest of them, three miles at least. And these places we call the upper region, accounting the air between the high places and the low as a middle region. We use these towers, according to their several heights and situations, for insolation, refrigeration, conservation, and for the view of divers meteors ; as winds, rain, snow, hail, and some of the fiery meteors also. And upon them, in some places, are dwellings of hermits, whom we visit sometimes, and instruct what to observe.

“We have great lakes, both salt and fresh, whereof we have use for the fish and fowl. We use them also for burials of some natural bodies ; for we find a difference in things buried in earth, or in air below the earth, and things buried in water. We have also pools of which some do strain fresh water out of salt, and others by art do turn fresh water into salt. We have also some rocks in the midst of the sea, and some bays upon the shore for some works wherein are required the air and vapour of the sea. We have likewise violent streams and cataracts, which serve us for many motions ; and likewise engines for multiplying and enforcing of winds, to set also agoing divers motions.

“We have also a number of artificial wells and fountains, made in imitation of the natural sources and baths ; as tinted upon vitriol, sulphur, steel, brass, lead, nitre, and other minerals. And again, we have little wells for infusions of many things, where the waters take the virtue quicker and better than in vessels or basins. And amongst them we have a water which we call ‘water of paradise,’ being by that we do to it made very sovereign for health and prolongation of life.

“We have also great and spacious houses, where we imitate and demonstrate meteors, as snow, hail, rain, some artificial rains of bodies, and not of water, thunders, lightnings : also generations of bodies in air, as frogs, flies, and divers others.

“We have also certain chambers, which we call ‘chambers of health,’ where we qualify the air, as we think good and proper for the cure of divers diseases, and preservation of health.

“We have also fair and large baths, of several mixtures, for the

cure of diseases, and the restoring of man's body from arefaction; and others for the confirming of it in strength of sinews, vital parts, and the very juice and substance of the body.

"We have also large and various orchards and gardens, wherein we do not so much respect beauty as variety of ground and soil, proper for divers trees and herbs; and some very spacious, where trees and berries are set, whereof we make divers kinds of drinks, besides the vineyards. In these we practise likewise all conclusions of grafting and inoculating, as well of wild trees as fruit-trees, which produceth many effects. And we make, by art, in the same orchards and gardens, trees and flowers to come earlier or later than their seasons, and to come up and bear more speedily than by their natural course they do; we make them also, by art, much greater than their nature, and their fruit greater and sweeter, and of differing taste, smell, colour, and figure from their nature; and many of them we so order that they become of medicinal use.

"We have also means to make divers plants rise by mixtures of earths without seeds; and likewise to make divers new plants differing from the vulgar, and to make one tree or plant turn into another.

"We have also parks and inclosures of all sorts of beasts and birds; which we use not only for view or rareness, but likewise for dissections and trials, that thereby we may take light what may be wrought upon the body of man; wherein we find many strange effects: as, continuing life in them, though divers parts, which you account vital, be perished and taken forth; resuscitating of some that seem dead in appearance, and the like. We try also poisons and other medicines upon them, as well of surgery as physic. By art likewise we make them greater or taller than their kind is, and contrariwise dwarf them and stay their growth; we make them more fruitful and bearing than their kind is, and contrariwise barren and not generative. Also we make them differ in colour, shape, activity, many ways. We find means to make commixtures and copulations of divers kinds, which have produced many new kinds, and them not barren, as the general opinion is. We make a number of kinds of serpents, worms, flies, fishes, of putrefaction; whereof some are advanced in effect to be perfect creatures, like beasts or birds, and have sexes, and do propagate. Neither do we this by chance, but we know beforehand of what matter and commixture, what kind of those creatures will arise.

"We have also particular pools where we make trials upon fishes, as we have said before of beasts and birds.

"We have also places for breed and generation of those kinds of worms and flies which are of special use, such as are with you, your silkworms and bees.

"I will not hold you long with recounting of our brewhouses, bake-houses, and kitchens, where are made divers drinks, breads, and meats, rare and of special effects. Wines we have of grapes, and drinks of other juice, of fruits, of grains, and of roots; and of mixtures with honey, sugar, manna, and fruits dried and decocted; also of the tears, or woundings of trees, and of the pulp of canes. And these drinks

are of several ages, some to the age or last of forty years. We have drinks also brewed with several herbs and roots and spices, yea, with several fleshs and white-meats; whereof some of the drinks are such, as they are in effect meat and drink both, so that divers, especially in age, do desire to live with them; with little or no meat or bread. And above all, we strive to have drinks of extreme thin part, to insinuate into the body, and yet without all biting, sharpness, or fretting; insomuch as some of them put upon the back of your hand will, with a little stay, pass through to the palm, and yet taste mild to the mouth. We have also waters which we ripen in that fashion as they become nourishing, so that they are indeed excellent drink; and many will use no other. Breads we have of several grains, roots, and kernels; yea, and some of flesh and fish dried, with divers kinds of leavenings and seasonings; so that some do extremely move appetites; some do nourish so, as divers do live on them, without any other meat, who live very long. So for meats, we have some of them so beaten and made tender and mortified, yet without all corrupting, as a weak heat of the stomach will turn them into good chylus, as well as a strong heat would meat otherwise prepared. We have some meats also, and breads and drinks, which taken by men enable them to fast long after; and some other that used make the very flesh of men's bodies sensibly more hard and tough, and their strength far greater than otherwise it would be.

"We have dispensaries, or shops of medicines, wherein you may easily think, if we have such variety of plants and living creatures more than you have in Europe, for we know what you have, the simples, drugs, and ingredients of medicines must likewise be in so much the greater variety. We have them likewise of divers ages, and long fermentations. And for their preparations, we have not only all manner of exquisite distillations and separations, and especially by gentle heats, and percolations through divers strainers, yea and substances; but also exact forms of composition, whereby they incorporate almost as they were natural simples.

"We have also divers mechanical arts which you have not, and stuffs made by them; as papers, linen, silks, tissues, dainty works of feathers of wonderful lustre, excellent dyes, and many others; and shops likewise as well for such as are not brought into vulgar use amongst us, as for those that are. For you must know, that of the things before recited many are grown into use throughout the kingdom; but yet, if they did flow from our invention, we have of them also for patterns and principles.

"We have also furnaces of great diversities, and that keep great diversity of heats, fierce and quick, strong and constant, soft and mild, blown, quiet, dry, moist, and the like. But, above all, we have heats in imitation of the sun's and heavenly bodies' heats, that pass divers inequalities, and, as it were, orbs, progresses, and returns, whereby we may produce admirable effects. Besides, we have heats of dungs, and of bellies and maws of living creatures, and of their bloods and bodies; and of hays and herbs laid up moist; of lime un-

quenched, and such like. Instruments, also, which generate heat only by motion ; and further, places for strong insulations ; and, again, places under the earth which by nature or art yield heat. These divers heats we use as the nature of the operation which we intend requireth.

“ We have also perspective-houses, where we make demonstration of all lights and radiations, and of all colours ; and of things uncoloured and transparent, we can represent unto you all several colours, not in rainbows, as it is in gems and prisms, but of themselves single. We represent, also, all multiplications of light, which we carry to great distance, and make so sharp as to discern small points and lines ; also all colorations of light, all delusions and deceits of the sight, in figures, magnitudes, motions, colours ; all demonstrations of shadows. We find, also, divers means yet unknown to you of procuring of light originally from divers bodies. We procure means of seeing objects afar off, as in the heavens, and remote places ; and represent things near as afar off, and things afar off as near, making feigned distances. We have also helps for the sight far above spectacles and glasses in use. We have also glasses and means to see small and minute bodies perfectly and distinctly, as the shapes and colours of small flies and worms, grains and flaws in gems, which cannot otherwise be seen ; observations in urine and blood, not otherwise to be seen. We make artificial rainbows, halos, and circles about light. We represent also all manner of reflections, refractions, and multiplication of visual beams of objects.

“ We have also precious stones of all kinds, many of them of great beauty, and to you unknown ; crystals likewise, and glasses of divers kinds, and amongst them some of metals vitrified, and other materials, besides those of which you make glass. Also a number of fossils and imperfect minerals which you have not ; likewise loadstones of prodigious virtue, and other rare stones both natural and artificial.

“ We have also sound-houses, where we practise and demonstrate all sounds and their generation. We have harmonies, which you have not, of quarter-sounds, and lesser slides of sounds ; divers instruments likewise to you unknown, some sweeter than any you have ; with bells and rings that are dainty and sweet. We represent small sounds as great and deep, likewise great sounds extenuate and sharp. We make divers tremblings and warbling of sounds, which in their original are entire ; we represent and imitate all articulate sounds and letters, and the voices and notes of beasts and birds. We have certain helps, which set to the ear do further the hearing greatly. We have also divers strange and artificial echos reflecting the voice many times, and as it were tossing it ; and some that give back the voice louder than it came, some shriller, and some deeper ; yea, some rendering the voice differing in the letters or articulate sounds from that they receive. We have also means to convey sounds in trunks and pipes in strange lines and distances.

“ We have also perfume-houses, wherewith we join also practises of taste : we multiply smells, which may seem strange ; we imitate smells,

making all smells to breathe out of other mixtures than those that give them. We make divers imitation of taste likewise, so that they will deceive any man's taste. And in this house we contain also a confiture-house, where we make all sweetmeats dry and moist, and divers pleasant wines, milks, broths, and salads, in far greater variety than you have.

"We also have engine-houses, where are prepared engines and instruments for all sorts of motions. There we imitate and practise to make swifter motions than any you have, either out of your muskets, or any engine that you have; and to make them and multiply them more easily, and with small force, by wheels and other means; and to make them stronger and more violent than yours are, exceeding your greatest cannons and basilisks. We represent also ordnance and instruments of war, and engines of all kinds; and likewise new mixtures and compositions of gunpowder, wildfires burning in water, and unquenchable; also fireworks of all variety, both for pleasure and use. We imitate also flights of birds: we have some degrees of flying in the air: we have ships and boats for going under water, and brooking of seas: also swimming-girdles and supporters. We have divers curious clocks, and other like motions of return, and some perpetual motions. We imitate also motions of living creatures by images of men, beasts, birds, fishes, and serpents: we have also a great number of other various motions, strange for quality, fineness, and subtilty.

"We have also a mathematical house, where are represented all instruments, as well of geometry as astronomy, exquisitely made.

"We have also houses of deceit of the senses, where we represent all manner of feats of juggling, false apparitions, impostures, and illusions and their fallacies. And surely you will easily believe that we that have so many things truly natural, which induce admiration, could in a world of particulars deceive the senses, if we would disguise those things, and labour to make them more miraculous. But we do hate all impostures and lies, insomuch as we have severely forbidden it to all our fellows, under pain of ignominy and fines, that they do not show any natural work or thing adorned or swelling, but only pure as it is, and without all affectation of strangeness.

"These are, my son, the riches of Solomon's House.

"For the several employments and offices of our fellows, we have twelve that sail into foreign countries under the names of other nations, for our own we conceal, who bring us the books and abstracts, and patterns of experiments of all other parts. These we call 'merchants of light.'

"We have three that collect the experiments which are in all books. These we call 'depredators.'

"We have three that collect the experiments of all mechanical arts, and also of liberal sciences, and also of practices which are not brought into arts. These we call 'mystery men.'

"We have three that try new experiments, such as themselves think good. These we call 'pioneers' or 'miners.'

"We have three that draw the experiments of the former four into titles and tables, to give the better light for the drawing of observations and axioms out of them. These we call 'compilers.'

"We have three that bend themselves, looking into the experiments of their fellows, and cast about how to draw out of them things of use and practice for man's life and knowledge, as well for works as for plain demonstration of causes, means of natural divinations, and the easy and clear discovery of the virtues and parts of bodies. These we call 'dowry men,' or 'benefactors.'

"Then, after divers meetings and consults of our whole number, to consider of the former labours and collections, we have three that take care out of them to direct new experiments of a higher light, more penetrating into nature than the former. These we call 'lamps.'

"We have three others that do execute the experiments so directed, and report them. These we call 'inoculators.'

"Lastly, we have three that raise the former discoveries by experiments into greater observations, axioms, and aphorisms. These we call 'interpreters of nature.'

"We have also, as you must think, novices and apprentices, that the succession of the former employed men do not fail ; besides a great number of servants and attendants, men and women. And this we do also ; we have consultations which of the inventions and experiences which we have discovered shall be published, and which not ; and take all an oath of secrecy for the concealing of those which we think meet to keep secret, though some of those we do reveal sometimes to the state, and some not.

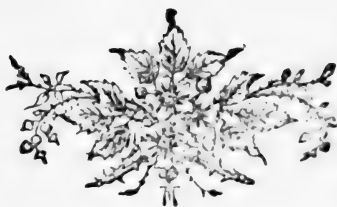
"For our ordinances and rites, we have two very long and fair galleries. In one of these we place patterns and samples of all manner of the more rare and excellent inventions ; in the other we place the statues of all principal inventors. There we have the statue of your Columbus, that discovered the West Indies ; also the inventor of ships ; your monk that was the inventor of ordnance and of gunpowder ; the inventor of music ; the inventor of letters ; the inventor of printing ; the inventor of observations of astronomy ; the inventor of works in metal ; the inventor of glass ; the inventor of silk of the worm ; the inventor of wine ; the inventor of corn and bread ; the inventor of sugars : and all these by more certain tradition than you have. Then we have divers inventors of our own, of excellent works, which, since you have not seen, it were too long to make descriptions of them ; and besides, in the right understanding of those descriptions you might easily err. For upon every invention of value, we erect a statue to the inventor, and give him a liberal and honourable reward. These statues are some of brass ; some of marble and touchstone ; some of cedar, and other special woods gilt and adorned ; some of iron ; some of silver ; some of gold.

"We have certain hymns and services, which we say daily of laud and thanks to God for his marvellous works ; and forms of prayers imploring his aid and blessing for the illumination of our labours, and the turning them into good and holy uses.

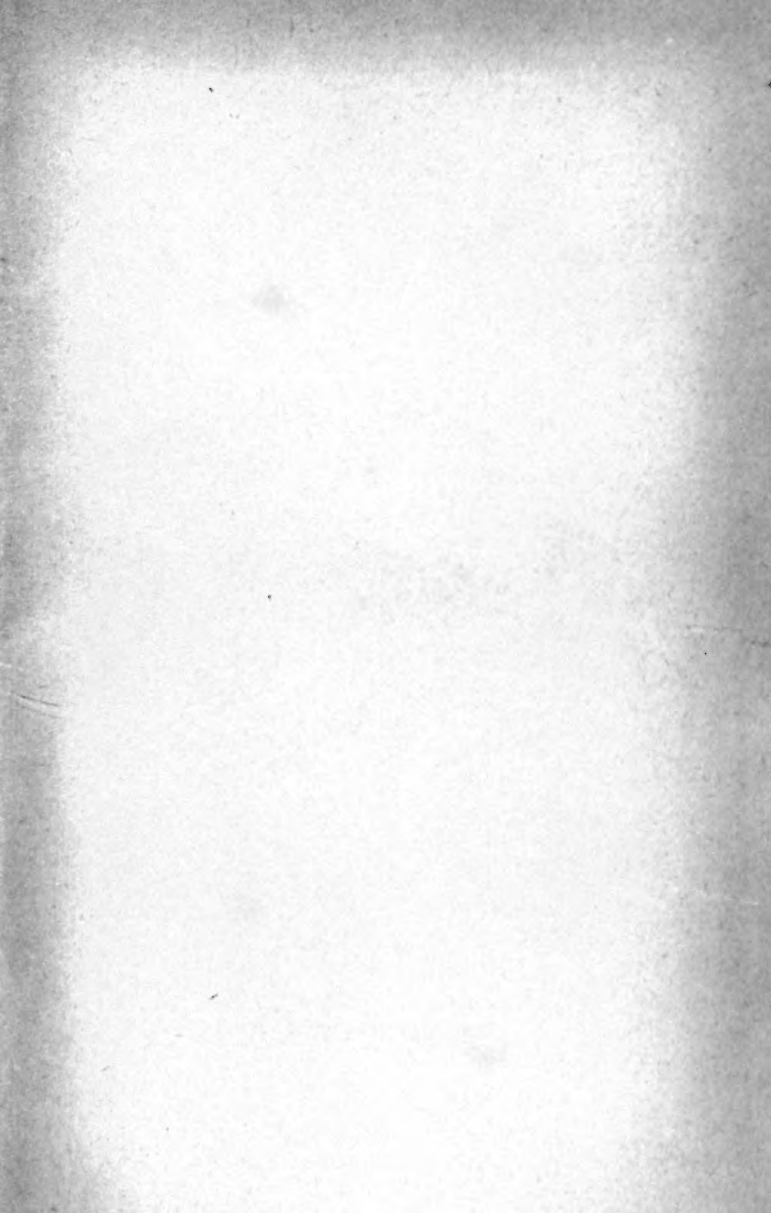
“Lastly, we have circuits or visits of divers principal cities of the kingdom, where, as it cometh to pass, we do publish such new profitable inventions as we think good. And we do also declare natural divinations of diseases, plagues, swarms of hurtful creatures, scarcity, tempests, earthquakes, great inundations, comets, temperature of the year. and divers other things; and we give counsel thereupon what the people shall do for the prevention and remedy of them.”

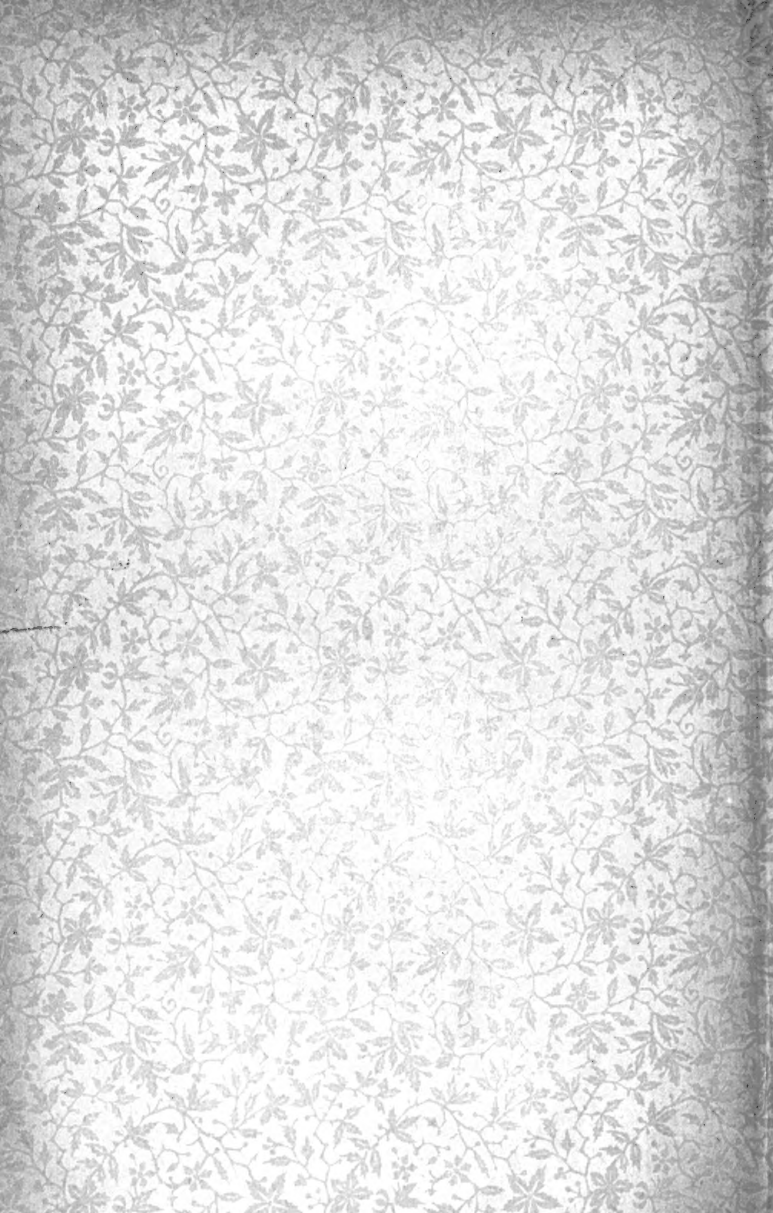
And when he had said this, he stood up: and I, as I had been taught, kneeled down, and he laid his right hand upon my head, and said, “God bless thee, my son, and God bless this relation which I have made; I give thee leave to publish it for the good of other nations. for we here are in God’s bosom, a land unknown.” And so he left me, having assigned a value of about two thousand ducats for a bounty to me and my fellows; for they give great largesses where they come upon all occasions.

(The rest was not perfected.)









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